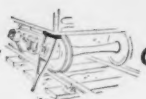


RAILWAY AGE

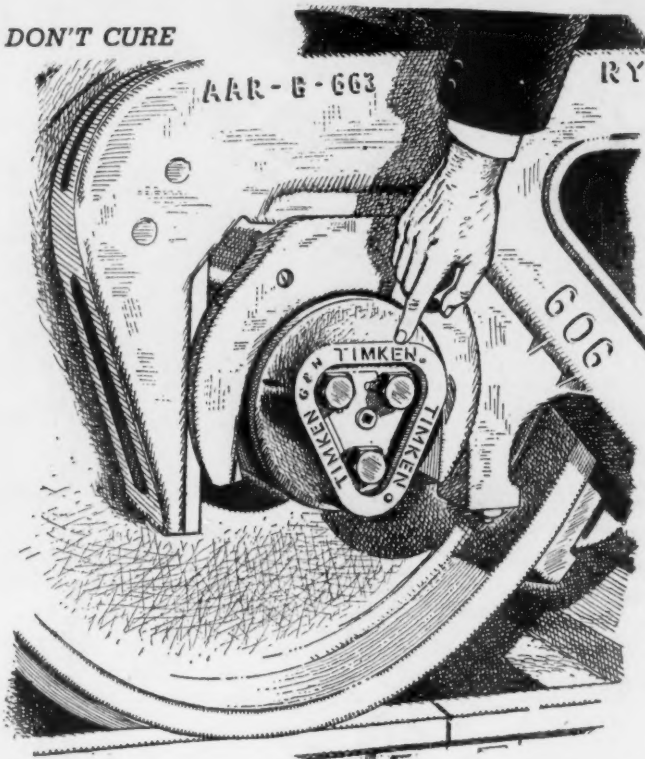
WORKBOOK OF THE RAILWAYS

THE INDUSTRY'S ONLY WEEKLY NEWSMAGAZINE

"CRUTCHES"  COST MONEY, BUT DON'T CURE

Here's the only real Cure to the Hot Box Problem

*...and TIMKEN® bearings pay
for themselves over
and over and over in operating
and maintenance savings*



THERE'S only one way to cure the hot box problem. That's to eliminate its cause. Unlike costly devices which merely serve as "crutches" in an attempt to improve friction bearing performance, Timken® tapered roller bearings eliminate the cause of hot boxes—the friction bearing itself.

**BIG
ADDED
SAVINGS** In addition, Timken bearings drastically reduce the costs of bearing inspection and lubrication. Railroads must still face these costs even when they "doctor" friction bearings with crutch devices. With Timken bearings, terminal bearing inspection time is cut 90%, lubricant costs are reduced as much as 89%. In fact, the Timken heavy-duty type AP (All-Purpose) bearing assembly can go for three years without adding lubricant. When the day comes that all railroads go "Roller Freight", they'll save more than \$190 million a year, earn an estimated 22% net annual return on the investment.

Timken bearings do away with hot boxes because they roll the load instead of sliding it. Metal-to-metal sliding friction is eliminated. And the tapered design makes Timken the only roller bearing you can count on to not only cure the hot box problem but also to reduce maintenance and operating costs to a minimum. The taper in Timken bearings prevents lateral movement. Result: there's no pumping action—less lubricant is needed; there's no scuffing or skewing—bearings last longer.

To insure bearing quality every step of the way, we make our own steel. We're America's only bearing manufacturer that does. And we make it nickel-rich for superior toughness.

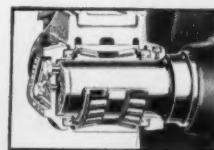
NEW CONVERSION PLAN

When you consider the added cost of buying and maintaining "crutch" devices for friction bearings, the price gap between friction and roller bear-

ings is smaller today than ever. Now, a practice adopted by one major American railroad promises to shrink it even more. This railroad has in effect a practical program for converting to "Roller Freight". Here's how it works. Every freight car coming into the shops for major repairs is being converted to roller bearings. This permits a steady shop and labor schedule and allows the railroad to pay for its conversion to roller bearings over a period of years.

So, instead of "making do" with unsatisfactory friction bearings and costly "crutches", invest to solve your journal bearing problems. Make sure you cure the hot box problem and bring your operating and maintenance costs down to rock bottom. Get Timken tapered roller bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

Only **TIMKEN®** bearings cure the hot box problem and
cut operating and maintenance costs to a minimum



HOW MANY STEPS IN THE LIFE OF A BRAKE BEAM?

The railroads use millions of time-consuming, money-wasting steps each year carrying freight car brake beams into reclamation plants for dismantling and reassembling—then back again to the stores department.

Truslock cuts the number of those steps right in half!

Here's why—

Worn or damaged brake heads account for at least half of the brake beams coming into reclamation plants. It stands to reason that a brake beam equipped with a quick-change brake head—replaceable in a jiffy without special tools or the need to disassemble the brake beam—will cut your reclamation costs by fifty percent.

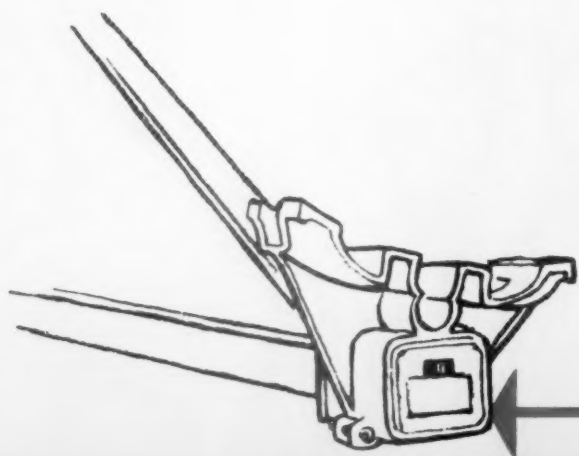
Economical maintenance is only one of the many TRUSLOCK features that have sold this premium brake beam to 72 railroads and private car lines.

YOUR FIRST BRAKE HEAD CHANGE ON A TRUSLOCK WILL SAVE YOU MORE THAN THE SMALL PREMIUM YOU PAY FOR THIS TOP-PERFORMANCE BRAKE BEAM . . . MAKES TRUSLOCK THE LOWEST COST NO. 18 BRAKE BEAM YOU CAN BUY.

BUFFALO BRAKE BEAM COMPANY
NEW YORK • BUFFALO

TRUSLOCK

**The Buffalo Brake Beam with the
Quick-Change Brake Head**



Mayari R...High-Strength, Corrosion-Resisting Steel



How Mayari R will lengthen the life of these new hopper cars

A fleet of 300 Bethlehem-built covered hopper cars recently took to the rails of the Seaboard Air Line Railroad. These cars, 36 ft 6 in. long over strikers, are of the quadruple-hopper type, and the Seaboard expects them to give long service despite the corrosion-producing conditions to which the cars will be subjected in specialized usage.

The reason for their unusual life-expectancy lies in the selection of Mayari R high-strength, low-alloy steel for parts which normally take the worst beating from corrosion. Specifically: roof sheets, hopper doors, hatch covers, longitudinal hoods. The railroad specified that Mayari R be used in the same thickness as the carbon steel used on earlier cars.

Where ordinary steel has a relatively free-scaling surface, Mayari R rust is closer-grained and more tightly adherent, greatly retarding the progress of corrosion. Tests conducted in industrial atmospheres have shown that Mayari R has from 5 to 6 times the corrosion-resistance of plain carbon steel.

Of course corrosion-resistance is only one advantage of Mayari R for railroad applications. Another important one is



the yield point of 50,000 psi which makes Mayari R about 50 pct stronger than carbon steel. Mayari R also takes paint better, and holds it up to 80 pct longer, depending on the type of paint used. It can be worked and welded as readily as other steels, using ordinary shop procedures.

Catalog 353 on Mayari R has a full section covering railroad applications and data. A copy is yours for the asking.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation. Export
Distributor: Bethlehem Steel Export Corporation



Why not use C.T.C. to cut operating expenses?

**\$84,000
saved by
reduced
overtime
payments**

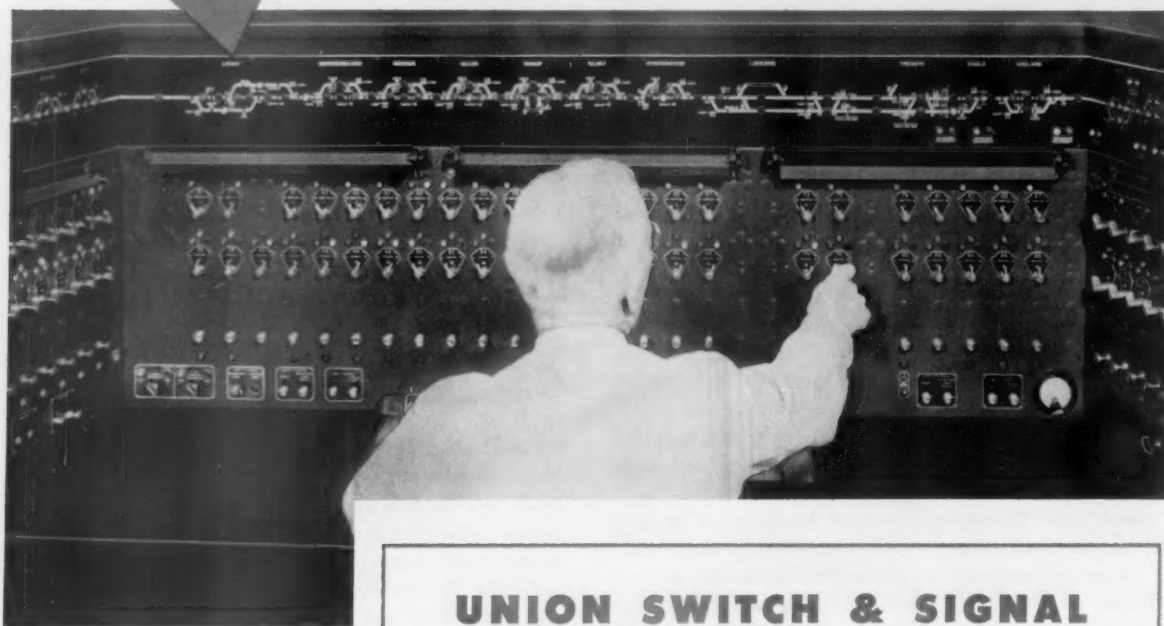
Railroads with long stretches of centralized traffic control territory are obtaining some remarkable reductions in operating expenses. For example, one road saved \$84,000 by reduced overtime payments alone on one division during the first year's operation with UNION C. T. C.

This road now has 466 miles of single-track main line equipped with C. T. C. . . . making possible a saving of five hours and more for through freight trains operating over the entire territory. And the increase in capacity of existing tracks elimin-

ated traffic bottlenecks which otherwise would have necessitated the construction of a second main track.


C. T. C. has also substantially reduced operating costs since just three sets of dispatchers are required for directing train movements over the territory by signal indication.

UNION C. T. C. pays for itself quickly through reductions in operating expenses. Why not let our traffic control engineers make a survey on your road to determine possible savings. Call our nearest office. There's no obligation.



UNION SWITCH & SIGNAL

DIVISION OF WESTINGHOUSE AIR BRAKE COMPANY

SWISSVALE  PENNSYLVANIA

NEW YORK • CHICAGO • ST. LOUIS • SAN FRANCISCO

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Workbook of the Railways

Vol. 140, No. 16

April 16, 1956

CONTENTS and Week at a Glance

New competition is cruising in . . .

. . . "Fishyback," the movement of any vehicle or demountable container that can be put aboard ship without transfer of lading, may spell new competition for railroads. . . . p.7

FORUM: Treasure hunt for \$700,000,000 . . .

. . . The ICC investigation of the passenger "deficit" offers the railroads an opportunity to make real progress in cost finding and realistic pricing, whatever the "loss" from passenger operations may turn out to be. . . . p.35

Pattern for the industry? . . .

. . . Is that what the Erie and Lackawanna have established in creating a workable process for cost-cutting coordination? In a Railway Age "Story at the Source" Presidents Johnston and Shoemaker of these two roads take on that question—along with others bringing the coordination picture up to date. . . . p.36

Do cheaper fuels lower costs? . . .

. . . Distillates, furnace oils and residuals are all offered the railroads as "cheap" diesel fuel. Two oil industry spokesmen point out that many other factors than the price per gallon enter into selection of a real economy fuel. . . . p.40

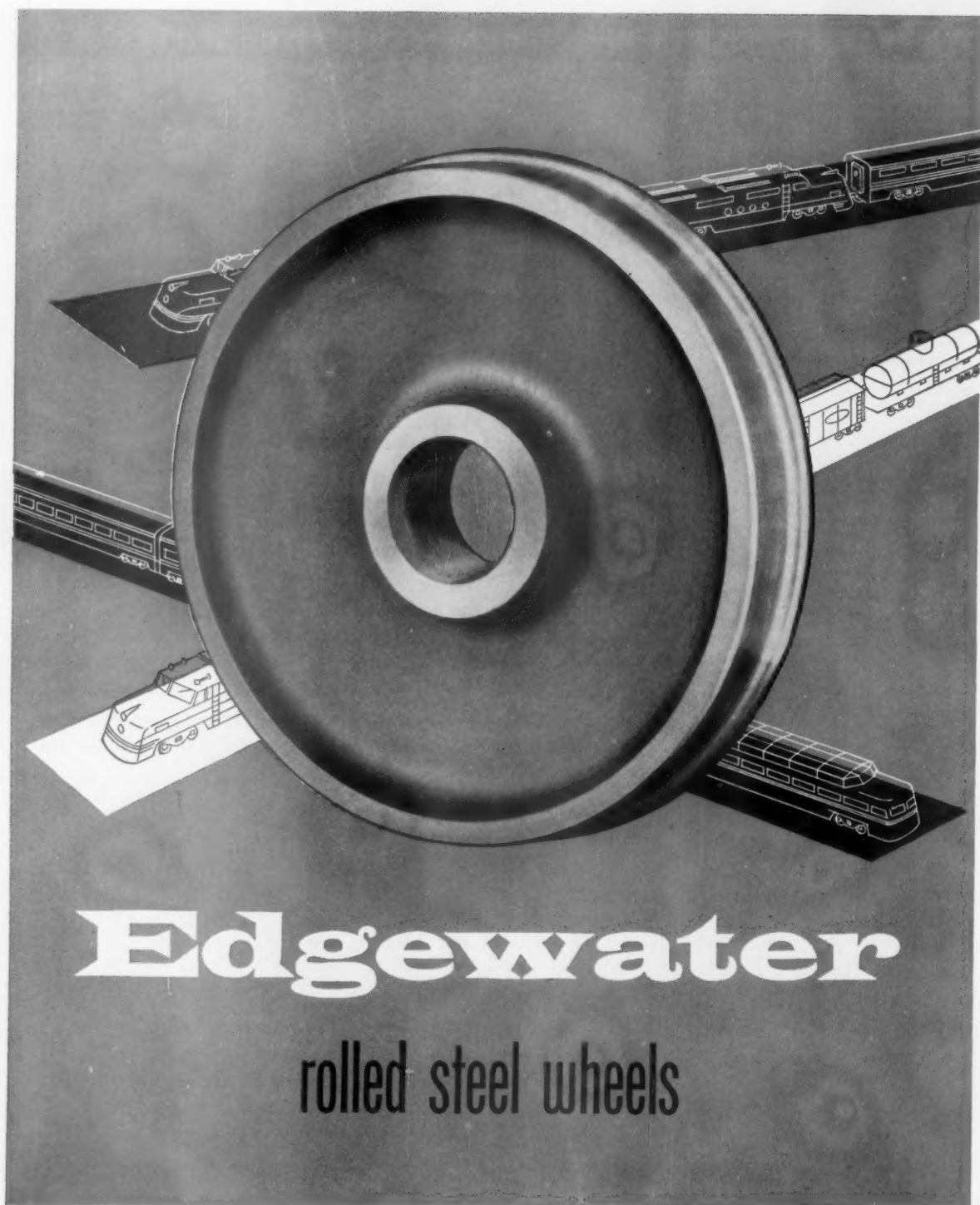
Scramble for engineers . . .

. . . is repeated yearly as the colleges prepare to turn out a new crop of graduates. A panel at the recent AREA annual meeting explored this situation with the special objective of finding out how the railroads are doing in this respect in competition with other industries, and what they can do to get better results. . . . p.44

BRIEFS

Eastern roads study the market . . .

. . . The Traffic Executives Association (Eastern Railroads) has a small force, mostly "borrowed" from constituent railroads, looking into the possibilities of a systematic study of the transportation market in Eastern territory—who's hauling what for what charge, and other related questions.



Edgewater

rolled steel wheels

FOR FREIGHT CARS
PASSENGER CARS
DIESEL LOCOMOTIVES



Edgewater Steel Company PITTSBURGH 30, PA.

Current Statistics

Operating revenues, two months	
1956	\$1,645,858,716
1955	1,479,733,207
Operating expenses, two months	
1956	\$1,302,523,359
1955	1,154,849,156
Taxes, two months	
1956	\$169,354,631
1955	148,763,957
Net railway operating income, two months	
1956	\$129,907,635
1955	136,462,623
Net income, estimated, two months	
1956	\$93,000,000
1955	98,000,000
Average price 20 railroad stocks	
April 10, 1956	104.13
April 12, 1955	94.34
Carloadings revenue freight	
Thirteen weeks, 1956	8,980,201
Thirteen weeks, 1955	8,316,710
Average daily freight car surplus	
Wk. ended Apr. 7, 1956	3,580
Wk. ended Apr. 9, 1955	23,254
Average daily freight car shortage	
Wk. ended Apr. 7, 1956	5,087
Wk. ended Apr. 9, 1955	2,142
Freight cars on order	
March 1, 1956	141,437
March 1, 1955	18,663
Freight cars delivered	
Two months, 1956	9,080
Two months, 1955	4,430
Average number of railroad employees	
Mid-February 1956	1,041,012
Mid-February 1955	1,005,836

RAILWAY AGE IS A MEMBER OF ASSOCIATED BUSINESS PUBLICATIONS (A.B.P.) AND AUDIT BUREAU OF CIRCULATION (A. B. C.) AND IS INDEXED BY THE INDUSTRIAL ARTS INDEX, THE ENGINEERING INDEX SERVICE AND THE PUBLIC AFFAIRS INFORMATION SERVICE. RAILWAY AGE, ESTABLISHED IN 1856, INCORPORATES THE RAILWAY REVIEW, THE RAILROAD GAZETTE, AND THE RAILWAY AGE GAZETTE. NAME REGISTERED IN U. S. PATENT OFFICE AND TRADE MARK OFFICE IN CANADA.

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Week at a Glance CONTINUED**Parmelee prediction—drop in net . . .**

. . . Dr. J. H. Parmelee, consulting economist of the AAR, is predicting that railroad net earnings this year may be down as much as 10% from the 1955 level. He expects freight traffic to be up about 5% but he looks for a "small decrease" in passenger traffic. In predicting a drop in net, he says "revenues will rise, of course, and so will expenses."

Milwaukee drops its orange . . .

. . . Now it's official—the Milwaukee will discard its traditional orange and red color scheme for passenger equipment in order to match the Union Pacific's yellow, with grey and red trim.

\$2.05 per hour . . .

. . . \$2.049 was the average straight time wage rate per hour for all railroad employees in December 1955. The December rate for all employees except "officials and staff" was \$2.012. Like averages for 1955's 12 months were \$1.963 and \$1.926, respectively. They compared, in turn, with 1954 averages of \$1.944 and \$1.908.

New rumbles over rates . . .

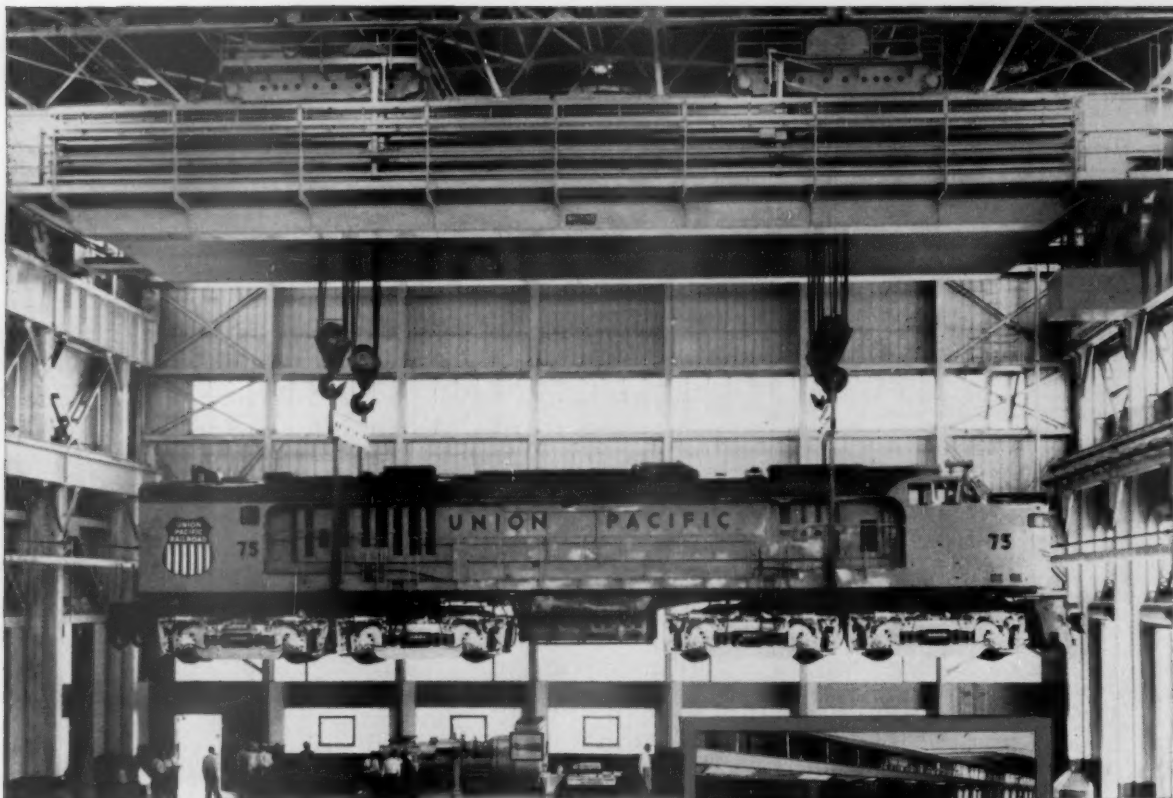
. . . Some roads aren't happy over results from the recent 6 per cent freight rate increase. They say the boost wasn't enough to offset the increased wage and material costs. For the time being, however, those favoring a "wait and see" attitude appear to be in the majority.

Growth years for pipe lines . . .

. . . Last year's revenues of large pipe lines reporting to the ICC were more than 2¼ times those of a decade earlier. The "large" lines are those having annual revenues of more than \$500,000. In 1946 there were 44 of them and their gross was \$273 million. In 1955, there were 69 and their gross was \$623 million. The increase was 128.1%.

It's up to the government . . .

. . . If it wants to keep deficit railroad services available for potential use in wartime evacuations, to make up the losses in subsidies, a Civil Defense witness said at an ICC ferry abandonment hearing. The obligation is not the railroads', he said.



Whiting crane at Union Pacific lifting a gas-turbine locomotive

at Union Pacific

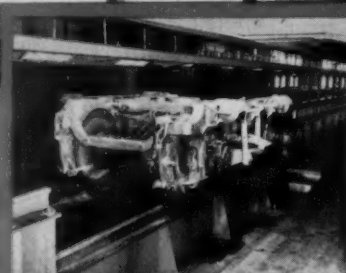
**WHITING PUTS RUSH JOBS
ON THE RIGHT TRACK...**

Union Pacific's new repair shop at Salt Lake City, Utah, quickly handles all types of maintenance and repairs from light service to complete heavy-duty overhaul. Over 4,000 units are inspected and serviced a month—and Whiting equipment helps put them back on the line with the barest minimum of down-time. Their Whiting 250-ton capacity overhead electric traveling bridge crane safely lifts the largest Union Pacific Diesels and even the heavier gas-turbine locomotives. As a result the job is done quickly and these big engines are back on the road in record time. A Whiting Drop Table with a capacity of 100 tons enables them to change trucks in a matter of a few hours. Both the crane and the drop table provide fast, efficient, low cost repair and service. Whiting equipment at Union Pacific is "paying-off." It will pay you to look into these latest Whiting methods—write today for complete information.

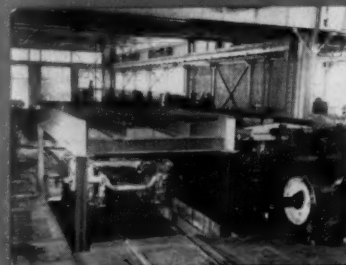
WHITING CORPORATION

15603 Lathrop Avenue, Harvey, Illinois

Manufacturers of Wheel Grinders • Cranes • Train Washers
Portable Electric Jacks • Drop Tables

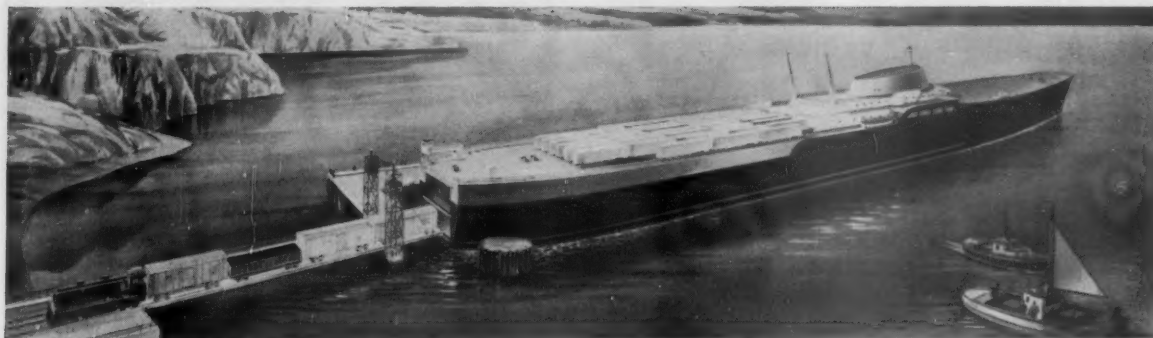


A truck ready for servicing
on the Whiting Drop Table



Release track top automatically raised as
spacer posts are lifted by Whiting Drop
Table. After it has been raised, truck is
easily rolled off





TWO VERSATILE VESSELS, capable of handling either freight cars or truck trailers, will be built by Alaska

Trainships for use between Pacific Northwest and Alaska. Estimated cost of the ships is \$18 million.

New Competition Is Cruising In

Coastwise water carriers, near dormant for a decade, are astir with plans to get back into the break-bulk freight business—Their tool: "Fishybacks"

Sometime this month, barring a last-minute hitch in plans, a pair of ocean-going tankers will open up a new kind of freight service between New York City and Houston, Tex., which may spell new competition for railroads.

The two vessels, owned by Pan Atlantic Steamship Corporation, will transport 33-ft trailer bodies on specially fitted decks. Each tanker will accommodate 58 fully loaded vans without affecting its basic oil-

carrying capacity. Trailers will be delivered to and from shipside by special highway truck chassis.

Pan Atlantic's undertaking with these tankers is significant because it is the latest development in "fishyback," hottest idea in coastwise shipping in ten years.

Effect on Railroads—It's hard to say, at this point, just what effect "fishybacks" will have on rail carriers. Obviously, if the system catches on, it means new competition. Yet it won't be across-the-board.

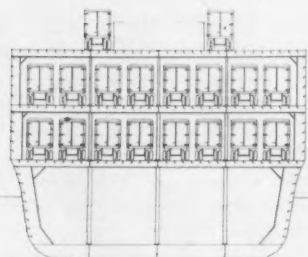
For example, the American Hawaiian Steamship Company, operating between Atlantic and Pacific coast ports via the Panama Canal, is planning a big container-type operation. The company points out that its containers will fit one to a truck chassis, or two to a railroad flat car. They will move to and from ship-board by conveyors.

American Hawaiian is pushing ahead with plans to build ten 18-knot ships for this container service. It hopes to get initial construction under way by mid-summer.

The Pan Atlantic operation, on the other hand, appears directly competitive. M. P. McLean, whose interests control Pan Atlantic, has said he feels this service will offer particular value to the motor carrier industry and to shippers who use it. Common carrier truckers will be invited to participate in joint rates and through routes.

Government's Role — Apart from the action of individual companies, the government's role in fostering "fishyback" development is something else worth watching. The Maritime Administration will provide mortgage guarantees, for instance, for Pan Atlantic's seven ships—up to 87½% of their cost. Because the vessels are "essential to defense," fast write-off certificates have been granted. Finally, the government has agreed to accept seven war-built cargo ships as a \$6.6 million "trade in" on the new roll on, roll off vessels.

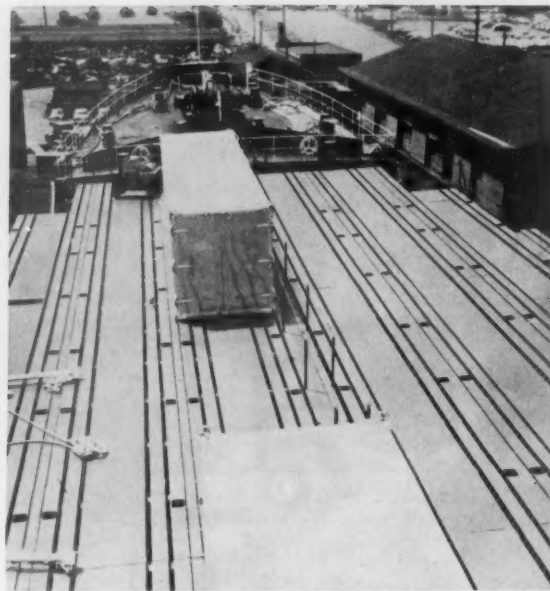
The MA is also in the terminal picture. Roll on, roll off service will require parking and marshalling space, hard to find in crowded dock



HOW TRAILERS will ride is shown in this line drawing of one of Pan Atlantic's proposed vessels.



TRAILER BODIES ON DECK and oil in the hold (above, left). This new seagoing freight service, slated to begin shortly, is something for railroads to study. Photograph



at right shows how trailer-size containers, anchored on deck, will ride on Pan Atlantic's converted tankers between New York and Houston.

areas. So the government is studying this problem, along with a number of port cities. At Providence, for example, voters have approved a big bond issue for new port development, but the city is holding off spending the money until it decides how roll on, roll off service is going to develop.

The term "fishyback" refers, generally, to movement of any vehicle or demountable container that can be put aboard ship without transfer of lading. As such, the idea really isn't new. Seatrains has been "fishybacking" freight cars for years.

But the swift increase in terminal handling costs in recent years has stimulated new interest in roll on, roll off operations. Ship operators believe it's the only way they can get around the present time-consuming and expensive methods used to load and unload vessels.

One Pioneer—Just how much time and money is involved is illustrated in the case of Pan Atlantic. The two converted tankers that begin service this month are merely fore-runners of a bigger roll on, roll off program.

Mr. McLean, a transportation executive with a motor carrier background, first proposed this "sealand" operation over three years ago. He wanted to connect Carolina ports with New York and Providence, R.I.

Today, McLean interests are in the van of the "fishyback" parade. Pan Atlantic is well along with plans to construct seven 650-ft trailer-carrying ships. The Maritime Administration has approved government mortgage insurance for the vessels, financial arrangements are being completed, and construction contracts probably will be let this summer. Cost of the seven ships will approximate \$72 million.

The vessels, first of which is expected to be ready in about two years, will ply between Eastern and Gulf ports. Each ship will have a capacity of 286 trailers, and the roll on, roll off design will make it pos-

sible to complete a loading or unloading operation in four to six hours. Minimum time by conventional methods is around 2½ days.

In addition to Pan Atlantic and American Hawaiian—and the Navy, which has a roll on, roll off prototype under construction—other coastal operators with "fishyback" plans include: Alaska Trainships (Seattle), Transportation Utilities (New York), TMT Trailer Ferry (Miami, Fla.), American Liberty Corporation (Houston, Tex.), Trainships, Inc. (New York), Water Highways (New York), Pacific Trailers (San Francisco), and the Puerto Rico Railroad & Transportation Co.

UP Tube System Speeds Messages

The Union Pacific is now sending messages, waybills and freight car information via pneumatic tube from its downtown Denver freight office to 40th street yard in just four and one-half minutes, compared to one hour when using messengers.

Messengers averaged five round-trips per day, although, with light traffic, they could make eight trips. Now it's a simple matter of putting a container in the tube, closing the door, and pressing a button.

The 1.6-mile tube is a one-way affair with a red light at each end which indicates when a message container is in the tube.

Another tube system connects the 40th street yard office with the yardmaster's tower at 36th street, for transmission of switch lists and information.

The tube systems are part of a \$2,000,000 improvement program involving the Union Pacific's Denver yards.

RAILWAY MARKET OUTLOOK THIS WEEK

a RAILWAY AGE Workbook Page

Carloadings Down.—Loadings of revenue freight in the week ended April 7 totaled 685,397 cars, the Association of American Railroads announced on April 12. This was a decrease of 39,547 cars, or 5.5%, compared with the previous week; an increase of 26,180 cars, or 4.0%, compared with the corresponding week last year; and an increase of 78,607 cars, or 13.0%, compared with the equivalent 1954 week.

Loadings of revenue freight for the week ended March 31 totaled 724,944 cars; the summary, compiled by the Car Service Division, AAR, follows:

REVENUE FREIGHT CAR LOADINGS			
For the week ended Saturday, March 31			
	1956	1955	1954
District			
Eastern	124,581	119,915	107,638
Alleghany	147,621	132,533	113,582
Pacahontas	61,097	50,979	39,874
Southern	138,192	108,127	116,585
Northwestern	74,958	74,071	67,072
Central Western	120,365	112,670	100,059
Southwestern	58,130	56,466	54,492
Total Western			
Districts	253,453	243,207	221,623
Total All Roads	724,944	654,761	599,302
Commodities:			
Grain and grain products	50,206	41,427	40,110
Livestock	6,876	7,091	7,529
Coal	139,870	102,131	87,438
Coke	13,024	10,462	7,951
Forest Products	47,040	41,660	38,720
Ore	23,516	16,694	14,588
Merchandise l.c.l.	62,243	61,726	64,591
Miscellaneous	382,169	373,370	338,375
March 31	724,944	654,761	599,302
March 24	697,248	634,628	601,414
March 17	685,985	650,924	609,959
March 10	697,601	662,283	609,937
March 3	710,996	653,575	590,576
Cumulative total, 13 weeks	8,980,201	8,316,710	7,962,439

In Canada.—Carloadings for the seven-day period ended March 21 totaled 74,723 cars, compared with 73,273 cars for the previous seven-day period, according to the Dominion Bureau of Statistics.

	Revenue Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada:		
March 21, 1956	74,723	35,854
March 21, 1955	68,370	33,166
Cumulative Totals:		
March 21, 1956	866,105	400,526
March 21, 1955	756,920	334,295

New Equipment

LOCOMOTIVES

► **New York Central.**—Ordered 30 1,750-hp diesel-electric road switchers, Electro-Motive; September delivery anticipated.

Purchases and Inventories

► **January Purchases Above January '55.**—January 1956 purchases by domestic railroads of all types of materials totaled approximately \$185,000,000, compared with \$164,101,000 in last year's first month; accompanying tables, giving breakdown of purchase and inventory figures for January 1956 and January 1955, were compiled by research department of Railway Age.

PURCHASES*

	January 1956	January 1955
	(000)	(000)
Equipment**	\$ 27,455	\$ 43,754
Rail	8,153	7,420
Crossties	5,823	5,385
Other Material	105,379	71,379
Total from Manufacturers	\$146,810	\$127,938
Fuel	37,916	36,163
Grand Total	\$184,726	\$164,101

* Subject to revision.

** Amount placed on order.

INVENTORIES*†

	Jan. 1, 1956	Jan. 1, 1955
	(000)	(000)
Rail	\$ 44,730	\$ 41,910
Crossties	88,013	107,772
Other Material	482,485	496,176
Scrap	21,793	19,285
Fuel	29,157	32,901
Total	\$666,178	\$698,044

* Subject to revision.

† All total inventory figures taken from ICC statement M-125 for the month indicated.

Overseas

► **Brazil Wants 29 Diesels.**—National Economic Development Bank of Brazil, acting for three of that country's railroads, has invited bids for supply of 29 diesel-electric locomotives, according to Foreign Commerce Weekly, bid invitation announcement, containing information on general characteristics of locomotives wanted, may be borrowed from Commercial Intelligence Division, Bureau of Foreign Commerce, Washington 25, D. C.

Lightweight Trains

► **Rock Island.**—Clarifying recent reports, D. B. Jenks, RI president, says the road will watch performance of all lightweight trains and perhaps, in a year or two, "might conceivably" replace its Minneapolis-Houston "Twin Star Rocket" or one of its other "Rockets" with new-type lightweight equipment.



"New Look," Plus Air Conditioning at Lawrence

The Santa Fe's new one-story station at Lawrence, Kan., features complete air conditioning and radiant heating.

The station, newest and most modern on the Santa Fe system, was dedicated recently.

February Net Up \$1 Million

It was \$47 million, compared with \$46 million in February 1955—Two months' net was down \$5 million from last year

Class I railroads in February had an estimated net income, after interest and rentals, of \$47,000,000, according to the Bureau of Railway Economics of the Association of American Railroads.

That was an increase of \$1,000,000 above the net of \$46,000,000 reported for February 1955. Because January's net was down \$6,000,000 from that of January 1955, the two-months' total was off \$5,000,000—\$93,000,000 compared with \$98,000,000 last year.

February's net railway operating income, before interest and rentals, was \$67,038,900, a little more than \$500,000 less than the \$67,563,492 reported for February 1955. The two-months' net railway operating income was \$129,907,635, compared with \$136,462,623 in the like 1955 period.

Twenty Class I roads failed to earn interest and rentals in this year's

first two months. Rate of return for the 12 months ended with February

CLASS I RAILROADS—UNITED STATES			
Month of February			
	1956	1955	
Total operating revenues	\$ 814,236,119	\$ 727,245,854	
Total operating expenses	641,106,316	565,612,008	
Operating ratio—percent	78.74	77.77	
Taxes	84,097,373	74,146,650	
Net railway operating income (Earnings before charges)	67,038,900	67,563,492	
Net income, after charges estimated)	47,000,000	46,000,000	
Two Months ended February 29, 1956			
Total operating revenues	\$1,645,858,716	\$1,479,733,207	
Total operating expenses	1,302,523,359	1,154,849,156	
Operating ratio—percent	79.14	78.04	
Taxes	169,354,631	148,763,957	
Net railway operating income (Earnings before charges)	129,907,635	136,462,623	
Net income, after charges estimated)	93,000,000	98,000,000	
averaged 4.2%, compared with 3.52% for the 12 months ended with February 1955.			

averaged 4.2%, compared with 3.52% for the 12 months ended with February 1955.

C&NW Discloses Management Errors

The Chicago & North Western's recently released 1955 annual report says management studies have revealed "instances of faulty techniques and procedures . . . which are

the results of practices in effect for many years."

The report—signed by Harry L. Wells, chairman of the finance committee, and J. E. Goodwin, execu-

tive vice-president—was dated March 31, the day before Ben W. Heineman became chairman, and Clyde W. Fitzpatrick, president, of the Chicago & North Western. The report was released on April 5.

Independent Audit—According to the report the so-called faulty techniques were uncovered by the first independent audit ever taken of the road's financial statements.

The auditors—Peat, Marwick, Mitchell & Co.—reported to the board in March that they had encountered difficulties and problems and would like to make a more complete study before the usual certification could be issued to the North Western.

"The difficulties referred to by the accountants are being corrected by improved accounting procedures and controls," the report said. Charges amounting to \$6,927,298 were made to surplus last year, with ICC permission, to correct estimates of revenues and tax refunds which had accumulated over the past six years as a result of out-of-date accounting techniques and errors in judgment. Obsolete steam locomotive materials amounting to \$715,769 were also written off against surplus.

Meanwhile, Arthur Andersen & Co.—the accounting firm that set up the new machine accounting system now in effect on the M&STL—has been retained by the North Western to study its accounting practices and procedures.

Senate Passes Trip-Lease Bill

A House interstate commerce subcommittee will hold hearings May 16 and 17 on pending trip-lease legislation which would trim the Interstate Commerce Commission's regulatory authority over the leasing of motor vehicles by highway carriers.

The Senate recently passed a toned-down version of its trip-lease bill.

The bill, which was opposed by the railroads, is S.898. The modified version approved by the Senate would end the commission's authority to ban trip-leasing of "farm trucks" for journeys toward home from points to which they haul agricultural products and other commodities exempt from regulation under the Motor Carrier Act's so-called "agricultural exemptions."

Actually, such "farm trucks" would be excluded from the trip-lease ban now embodied in the commission's proposed leasing rules. That phase of the rules, with its general requirement that leases be of 30 days duration, has never been effective. It is now scheduled to become effective July 1, having been postponed several times.

Debate on the bill pointed up the feeling of its sponsors that the right of "farm trucks" to enter trip-leasing arrangements should be protected by statute. Senator Smathers, Democrat of Florida, who is chairman of the Surface Transportation Subcommittee of the Senate Committee on Interstate and Foreign Commerce, put it this way:

"Any decision by the commission today on this 30-day leasing rule, which will protect the proper interests of agriculture, might not be the decision of the commission tomorrow or at some time in the future when the composition of the commission has changed. . . . Since May 1951, when the original 30-day rule was issued by the commission, 10 of its 11 members have departed by resignation, retirement, or expiration of their terms."

Another member of the interstate commerce committee, Senator Payne, Republican of Maine, said the bill as amended "will clearly establish the authority of the ICC to regulate trip leasing, except with regard to the duration of leases of carriers of agricultural and fishery products." He also said that, "as a general proposition," the bill would "put into law the present provisions of the commission's proposed regulations."

G. Lloyd Wilson Dies

Dr. G. Lloyd Wilson, 59, professor and chairman of the department of transportation and public utilities in the University of Pennsylvania's Wharton School of Finance, died in Philadelphia April 11. Dr. Wilson, a frequent contributor to *Railway Age*, had been transportation counsel for the United States Steel Corporation since 1944.

Way Cleared for Fare-Hike Tariffs of Southern Roads

The Interstate Commerce Commission has paved the way for filing by Southern railroads of tariffs propos-

ing passenger-fare increases like those proposed by Eastern and Western roads. The commission issued an April 9 order granting Southern lines the necessary relief from regular filing rules and outstanding commission orders.

They were expected to follow

through with the filing of master tariffs and connecting link-supplements designed to make the increase effective May 15. Eastern and Western roads had previously got like relief for the filing of tariffs with a May 1 effective date (*Railway Age*, April 2, p. 7 and April 9, p. 8).

White Links RR Future to Fair Return

Given "a climate of business at a reasonable profit," Delaware & Hudson President William White said at Buffalo, N.Y., April 10, "there need be no fear" about railroads meeting future demands and needs of the country.

Speaking as one of a panel discussing governmental and carrier responsibility, during an institute of the Transportation Association of America, Mr. White said railroads cannot earn a fair return unless "artificial barriers that restrain competition" are removed.

He charged that the "terrible wave of railroad bankruptcies in the thir-

ties, an overall poor dividend record and recurring car shortages" were the "devastating results" of "the fact that the railroad industry has never been able to earn an adequate rate of return."

In the day's main speech, Richard L. Bowditch, chairman of C. H. Sprague & Son Co., and a former president of the United States Chamber of Commerce, tied growing transportation needs to the expansion of the country. He commented that some government involvement in transport matters can be helpful but emphasized that "the wrong amount can be a curse."

Radar Used to Chart Microwave Paths

A new, economical method to determine proposed locations of microwave terminal and repeater stations has been used on the Detroit & Mackinac and the Chicago Great Western.

Because microwave is beamed radio (generally line-of-sight between stations, a path must be chosen with no obstacles, man-made or natural. To obtain a profile of the earth's surface, an adaptation of wartime

radar, called radar profiling, has been developed. Using an airborne computer, which combines both vertical radar measuring devices as well as highly accurate strain gauge altimetry, the sea-level elevation is determined for all portions of the path directly beneath the airplane, which acted as the observation platform.

This method of radar profiling the
(Continued on page 13)



RADAR, from the survey plane, profiles the topography of a proposed microwave system as the plane flies along the microwave beam path. Radar

reflections synchronized with altimeter readings produce data for computation of relationship between the airplane's elevation and mean sea level.

Class I RR Purchases Up \$212.3 Million in 1955

Class I railroads in 1955 spent \$1,637,075,000 for fuel, materials and supplies, excluding equipment, the Association of American Railroads has announced. This was an increase of \$212,314,000 compared with such expenditures in 1954.

For fuel alone, railroads spent \$453,852,000 in 1955, compared with \$433,210,000 in 1954. Expenditures for coal totaled \$76,731,000 in 1955, compared with \$81,013,000 in 1954. Expenditures for diesel fuel oil last year totaled \$331,766,000.

Expenditures for iron and steel products amounted to \$50,829,000 last year, compared with \$406,476,000 in 1954. Last year's expenditures for miscellaneous products including cement, lubricating oils and grease, ballast, electrical materials, interlocking and signal material totaled \$554,865,000, compared with \$470,545,000 in 1954. Forest products cost \$118,529,000 in 1955, compared with \$114,430,000 in 1954. Detailed figures are set out in the accompanying tables, all of which are based on carrier reports to the Bureau of Railway Economics.

ANNUAL PURCHASES OF MATERIALS AND SUPPLIES (EXCLUDING EQUIPMENT), 1923-1955—Class I Railroads (Thousands of dollars)

Year	Fuel	Forest products	Iron and steel products	Miscellaneous	Total	Total less fuel
1923	\$617,800	\$232,511	\$464,955	\$423,437	\$1,738,703	\$1,120,903
1924	471,656	180,872	365,610	324,917	1,343,055	871,399
1925	459,465	170,305	419,255	343,018	1,392,043	932,578
1926	473,354	186,291	507,302	392,085	1,559,032	1,085,678
1927	438,821	175,729	407,304	374,074	1,395,928	957,107
1928	384,608	160,794	374,575	351,364	1,271,341	886,733
1929	364,392	157,551	406,962	400,630	1,329,535	965,143
1930*	306,500	134,600	304,700	292,700	1,038,500	732,000
1931*	244,500	76,250	188,600	185,650	695,000	450,500
1932*	178,250	52,200	94,530	120,000	445,000	266,750
1933	180,526	42,442	104,327	138,555	465,850	285,324
1934	217,294	64,271	150,671	167,988	600,224	382,930
1935	232,723	57,367	135,397	167,538	593,025	360,302
1936	272,270	76,683	239,486	214,982	803,421	531,151
1937	294,293	104,707	310,658	256,725	966,383	672,090
1938	243,783	56,968	127,141	155,390	583,282	339,499
1939	257,273	69,971	236,338	205,732	769,314	512,041
1940	273,556	82,185	264,480	234,242	854,463	580,907
1941	349,765	103,771	379,951	327,787	1,161,274	811,509
1942	426,335	115,227	353,957	364,292	1,259,811	833,476
1943	527,296	150,255	339,631	377,099	1,394,281	866,985
1944	585,832	158,957	431,692	434,048	1,610,529	1,024,697
1945	555,155	136,962	418,438	461,849	1,572,404	1,017,249
1946	553,153	148,984	416,303	452,115	1,570,555	1,017,402
1947	691,630	171,592	503,906	542,022	1,909,209	1,217,579
1948	833,040	166,488	590,289	593,514	2,183,331	1,350,291
1949	564,159	142,232	454,079	480,936	1,641,406	1,077,247
1950	608,719	121,256	509,506	500,427	1,739,908	1,131,189
1951	621,497	188,186	703,885	662,291	2,175,859	1,554,362
1952	538,659	176,966	513,060	589,065	1,817,750	1,279,091
1953	509,611	176,189	612,584	622,097	1,920,481	1,410,870
1954	433,310	114,430	406,476	470,545	1,424,761	991,451
1955	453,852	118,529	509,829	554,865	1,637,075	1,183,223

*Railway Age estimates.

Note: "Iron & Steel products" and "Miscellaneous," 1927-1948, revised to conform with report MS-24, Year 1949.

PURCHASES OF FUEL, MATERIAL AND SUPPLIES— Railways of Class I—Calendar Years 1955 and 1954

Item	1955	1954
FUEL:		
Bituminous coal	\$73,703,000	\$77,142,000
Anthracite coal	3,028,000	3,871,000
Fuel oil—Residual	28,552,000	28,979,000
Fuel oil—Diesel	331,766,000	307,772,000
Gasoline	10,159,000	9,727,000
All other (coke, wood, fuel for illumination)	6,644,000	5,819,000
Total fuel	453,852,000	433,310,000
FOREST PRODUCTS:		
Cross ties (treated and untreated)	\$53,178,000	\$63,459,000
Switch & bridge ties (treated & untr.) and timber	19,755,000	16,771,000
Lumber (equipment, rough and finished)	34,539,000	25,221,000
Other forest products	11,057,000	8,979,000
Total forest products	118,529,000	114,430,000
IRON AND STEEL PRODUCTS:		
Steel rail (new and second hand, except scrap)	\$95,388,000	\$86,906,000
Wheels, axles and tires	59,117,000	39,728,000
Frogs, switches and crossings, and parts of same	21,866,000	18,901,000
Track, fastenings, track bolts, spikes, etc. Iron bridges, turntables & struct. steel, all kinds	80,929,000	57,962,000
Bar iron and steel, spring steel, tool steel, unfabricated rolled shapes, wire netting and chain, except light coil; boiler, firebox, tank, and sheet iron and steel, all kinds	8,311,000	10,280,000
Forgings and pressed steel parts for locomotives	34,952,000	23,849,000
Car forgings, iron and steel, and fabricated or shaped steel, for passenger and freight cars	1,410,000	1,330,000
Flues and tubes for locos. & stationary boilers	35,862,000	24,464,000
Bolts, nuts, washers, rivets, lag screws, pins & studs	1,326,000	1,327,000
Springs, helical and elliptical, all kinds for locomotives and cars	11,854,000	7,958,000
Locomotive and car castings, beams, couplers, frames and car roofs	6,648,000	4,744,000
	72,000,000	60,722,000

Item	1955	1954
Track and roadway tools, all kinds, including hand and power operated tools, miscellaneous roadway material and fencing. Motor, hand, push and trailer cars, and parts for same	16,256,000	12,939,000
Machinery and repair parts	19,125,000	21,573,000
Pipe, iron and steel, and fittings, all kinds	8,939,000	6,777,000
Hardware, all kinds, including nails	10,020,000	7,085,000
Hand & small machine tools, such as drills, taps, reamers, dies, chasers, including air tools & parts	12,822,000	10,686,000
All other iron and steel products, including pig iron, cast iron water pipe and culvert pipe	13,004,000	9,243,000
Total iron and steel products	509,829,000	406,476,000
MISCELLANEOUS:		
Cement, lime, plaster, bldg. brick & other bldg. matls. except cast iron water pipe and culvert pipe	\$9,985,000	\$7,749,000
Lubricating oils and grease; illuminating oils; boiler compound; waste	40,237,000	35,220,000
Non-ferrous metal and non-ferrous metal products	41,799,000	28,652,000
Ballast	22,531,000	20,203,000
Electrical materials including electrical material for Diesel locomotives	50,102,000	42,790,000
Stationery and printing	31,709,000	31,318,000
Commissary supplies for dining cars & restaurants	34,911,000	36,554,000
Rubber and leather goods	10,639,000	8,580,000
Glass, drugs, chemicals, including chemicals for timber treatment; painters' supplies	47,725,000	41,476,000
Arch brick for locomotives	1,218,000	1,108,000
Passenger car trimmings	15,146,000	12,764,000
Locomotive, train and station supplies	25,722,000	22,989,000
Interlocking and signal material	45,660,000	37,847,000
Telegraph, telephone and radio material	11,947,000	12,622,000
Air brake material	18,580,000	14,294,000
Standard & spec'l mechanical appliances for locos	5,933,000	5,578,000
Automotive equip. & supplies, except diesel mat'l	14,934,000	11,929,000
Diesel material not elsewhere classified	81,900,000	69,870,000
All other miscellaneous purchases	44,187,000	29,002,000
Total miscellaneous purchases	554,865,000	470,545,000
Grand Total	\$1,637,075,000	\$1,424,761,000

(Continued from page 11)

earth's surface from the air was developed by Capt. W. C. Eddy of Television Associates, Inc., Michigan City, Ind. His company has used the method successfully for surveying microwave paths for several railroads, and public utilities such as the Union Electric Company and the Alabama Power Company, as well as many leading pipeline companies. A more detailed exposition of the operation appears in the April issue of *Railway Signaling & Communications*.

RRs, NIT League Oppose Per Diem Bill

Railroad shippers, as represented by the National Industrial Traffic League, joined the carriers in opposing the penalty per diem bill at recent hearings before a subcommittee of the Senate Committee on Interstate and Foreign Commerce.

The bill, S.2770, was introduced at the request of the Interstate Commerce Commission by the committee's chairman, Senator Magnuson, Democrat of Washington. It would give the commission authority to impose penalty per diem charges and thus use the freight-car-rental rate as an instrument to promote prompt movement of cars.

Setback in Court—The commission's undertaking to do that was struck down by the courts in 1947. It has since sought legislative relief from time to time, first in its annual report for 1950.

The commission's presentation in support of the bill at the Senate hearing was made by Commissioner Clarke, who is in charge of its car service work. His statement was along lines of the argument for penalty per diem powers which he included in his March 22 address to the Allegheny Regional Shippers Advisory Board (*Railway Age*, April 2, page 56).

If the bill were enacted, he told the subcommittee, the commission's first step would be to determine the extent to which railroads, "individually and collectively," are deficient in car ownership. On the basis of such determination, the commission would adopt a "car ownership formula" which would put it in a position "to exert pressure upon deficit railroads to increase their ownership to the prescribed level within a rea-

sonable time or suffer penalty per diem charges in the event of another car shortage."

In response to questions, Mr. Clarke said the commission does not now have its own ownership formula. He added that the commission "understands" the AAR has a "comprehensive formula."

The NIT League position in opposition to the bill was stated by the chairman of its Legislative Committee—William H. Ott, Jr. The commission, he said, now has adequate power to accomplish all of the bill's stated objectives. Use of its authority to issue operating regulations, Mr. Ott added, "is the normal method for handling such situations, used by the commission today and adequate for the future."

Railroad opposition was expressed by two officers of the AAR and by President J. M. Hood of the American Short Line Railroad Association. The AAR witnesses were Chairman A. H. Gass of the Car Service Division and Thomas L. Preston, general solicitor.

Mr. Gass argued that the proposed legislation could hinder rather than expedite shipments by rail. Calling the bill an apparent "indirect measure of coercion" to force some railroads to increase car ownership, Mr.

Preston warned that its enactment "would be a long step in the direction of government operation."

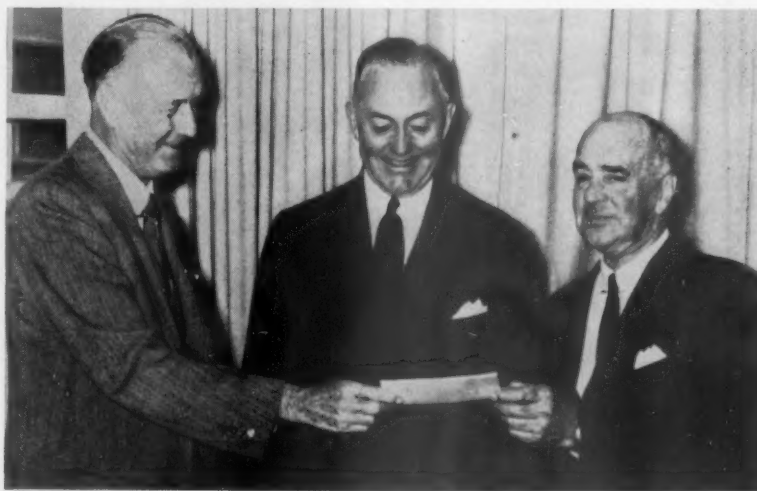
Mr. Hood asserted that arguments in support of the proposed legislation were "just as fallacious" now as they were at previous hearings on the matter. He cited the 1947 court decision which said the commission argued as though the per diem rate was the only means it had of speeding car movements. The cited portion of the decision rejected that contention and went on to say:

"The commission has power . . . to establish reasonable rules, regulations and practices with respect to car service, which includes the use, interchange and return of cars . . . and to prescribe penalties for non-observance of its mandates. Those powers are broad."

Supporters of the bill, other than the commission, included the National Association of Railroad and Utilities Commissioners, which was represented by its general solicitor, Austin L. Roberts, Jr.; the American Farm Bureau Federation, which was represented by its assistant legislative director, Matt Triggs; and a group of senators.

The latter included Senator Morse, Democrat of Oregon, whose presenta-

(Continued on page 16)



Ever See a Check for \$31,589,521.12 ?

Harry A. DeButts (center), president of the Southern, watches as a check for that amount, largest ever written by the railroad, is handed by John B. Hyde (right), the Southern's financial vice-president, to Herbert E. Twyefort, vice-president of the Guaranty Trust

Company of New York. The check paid off in full all the road's outstanding 50-year-old development and general mortgage non-callable bonds, which were due April 1. The mortgage was paid off entirely from treasury cash without financing.

Now AAR alternate standard **A combination of maximum**

Spring-mounted guard arm plungers eliminate normal running slack and provide vertical safety interlock.

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Over 2 billion car and locomotive miles of high-speed passenger train service have provided an excellent record of safety, comfort and smooth train operation.

Controlled-Slack Couplers and Slack Free Yokes can be applied to all passenger cars with standard sill spacing, without need for center sill alterations. *Here's a coupler that offers you a safe, practical way to save money.*



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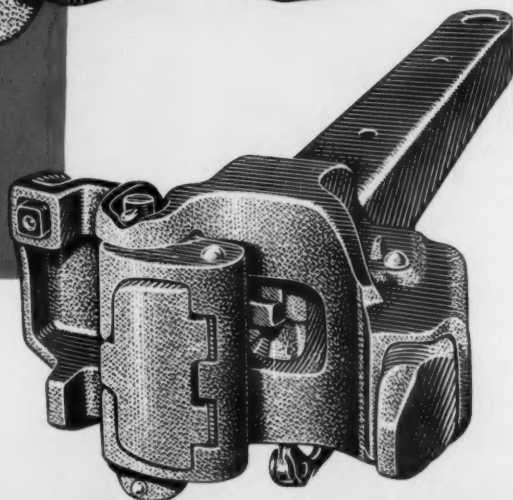
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(Continued from page 13)

tion was a speech like one he made on the Senate floor later in the day. The senator assailed the commission, saying it should "carry out its statutory functions instead of accepting propaganda of the railroads" on the matter of car supply.

At the same time, the senator assailed the commission's latest car-conservation measure—Service Order No. 910 which is scheduled to become effective April 9. The order directs railroads to discontinue practices which "wilfully delay the movement of loaded freight cars" for the purpose of increasing their time in transit (Railway Age, March 26, page 11).

While the order applies to delaying tactics with respect to all car-load freight, it is understood that

the commission's main purpose is to end slow movements of lumber. Having heard from Oregon lumber ship-

pers, some of whom were with him at the hearing, the senator assailed the order.

19 Roads Paid Safety Fines in March

Nineteen roads paid fines totaling \$6,500 plus costs in March on 65 counts of violations of the Safety Appliance Acts, the Interstate Commerce Commission has reported. The Rock Island was fined a total of \$1,100 on 11 counts, highest among the roads reported on.

The New York Central and the Texas & New Orleans paid fines of \$100 and costs on one count each of violation of the Hours of Service Law.

1955 Figures—Fifty-eight railroads last year paid fines totaling

\$53,200 and costs for violations of the Safety Appliance Acts, and eight roads paid \$3,900 and costs for violations of the Hours of Service Law.

A compilation issued by the commission showed that the 1955 safety-act fines came after the roads involved had confessed to 532 counts of violation while thirty-five counts were involved in hours-of-service cases.

The commission also reported that in January of this year seven roads paid fines totaling \$4,500 and costs (Continued on page 47)

Railroading | After Hours

"Better Service" and "Booster" Clubs

I was recently a guest at an evening meeting of the local chapter of the Chesapeake & Ohio Better Service Conference at Richmond, Va. Despite unfriendly weather, there was an attendance of upwards of 200—covering the entire range of local railroad occupations, from employees in the ranks up to vice-presidents, of whom there were two in attendance.

There are several railroads which have system-wide employees' associations, variously known by such names as "better service" or "booster" clubs. Their purpose, as the names suggest, is to improve service and traffic. They serve a further indirect purpose of improving employee relations and railroad industry spokesman-ship. Why shouldn't there be some organization like this on every railroad?

About 20 per cent of those present at the Richmond meeting were women—some of them employees, but half at least being wives of employees. It certainly is no disadvantage when wives of employees interest themselves in their husbands' work.

by
James G.
Lyne



Editor
Railway
Age

The principal subject for discussion on this particular evening was the Cabinet Committee Report on Transportation Policy—and most of the questions for which answers were sought had to do with the criticisms which have been made of this report. There's no doubt about it that most employees who attended this Richmond meeting are fully equipped to discuss this report with anybody, and to give conclusive answers to critical questions.

The C&O Better Service Conference is a system-wide movement, with "locals" at some 25 points, and numbering thousands of employees as members. At monthly meetings all aspects of improved railroad service come under examination and constructive discussion.

This past January, leaders from the local chapters attended a system-wide meeting at White Sulphur Springs for two days—under the chairmanship of W. K. Morton, as-

sistant to vice-president—personnel. President Walter Tuohy attended, and there was a speaker (usually the top officer) from each department of the railroad to tell the conference about the work and the problems of his department.

Learning About Other Departments

Railroad work is highly departmentalized—with some tendency for employees (not to mention officers and supervisors) to know more and care more for their specialized work than for the successful performance of the company or the industry as a whole. At the same time, there also exists a willingness on the part of a lot of railroad people to learn more about other departments—and a healthy curiosity about the business as a whole.

Since the need for such broadened knowledge exists—and since there are interested employees awaiting this knowledge, and an opportunity to become after-hours spokesmen for their railroad—all that's left for management to do is to provide the organizational machinery for making this latent employee interest an active one. These Better Service conferences—by whatever name they may be called—fit an industry need like a well-worn shoe fits the foot.



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Flat cars, pulpwood cars, ore cars and many other types of quality freight cars with Commonwealth Underframes assure superior, better-built equipment providing such advantages as:

- Greater Strength with Less Weight
- Longer Service Life
- Greater Availability
- Lowest Maintenance Costs
- More Revenue Per Car

... and Commonwealth One-Piece Cast Steel Underframes are available in all standard sizes.

Plan wisely for the future and insure your investment—equip your quality freight cars with cast steel underframes.



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OR EFFORT**

with



When a farmer wants to get rid of weeds, he plows them under. Farmers know from experience that's the best, quickest, easiest and most inexpensive way of controlling weeds.

The same principles hold true on railroads when you use the Kershaw Ballast Regulator, Scarifier and Plow.

This versatile machine will do away with weed control problems. At the same time, (and for no extra cost), it will provide drainage, reclaim, regulate and shape the ballast shoulder.

No work trains or chemicals are involved. Just the Kershaw Ballast Regulator, Scarifier and Plow doing **ALL** these jobs at the same time and for the same money.

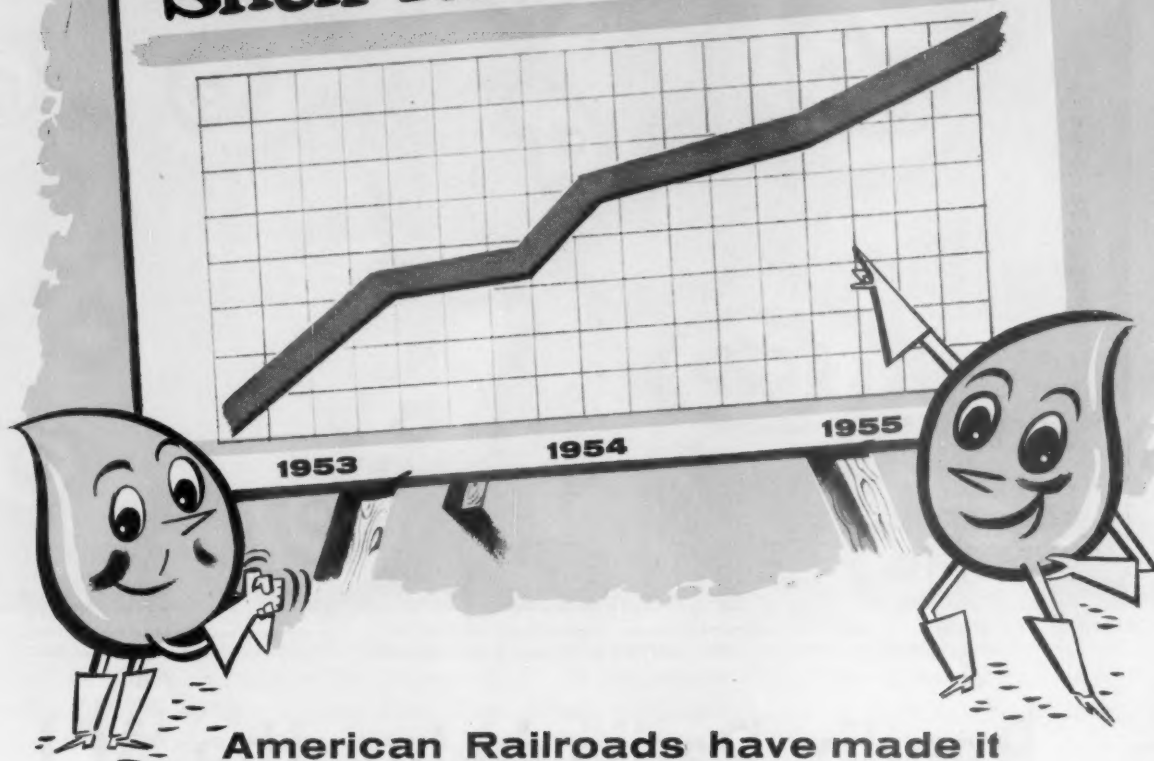
The KERSHAW
**BALLAST REGULATOR
SCARIFIER and PLOW**
"TRACK PATROL"



Recognize This Symbol of Leadership



Shell Talona R Oil 40



**American Railroads have made it
the fastest growing diesel locomotive
lubricant in the U. S. A.**

The acceptance of Shell Talona R Oil 40 by American railroads has been remarkable. Today, whether judged by number of units or horsepower, this lubricant is outstripping all others in rate of growth.

There is good reason for this: Maximum engine performance can be expected when you use Shell Talona R Oil 40.

Superior anti-wear protection

Greatly reduced wear on pistons, rings and cylinder walls is assured because of the se-

lected combination of additives used in Shell Talona R Oil 40.

Maintains engine performance

The balanced formula of Shell Talona R Oil 40 combines high oxidation stability and anti-corrosive power. It prevents fouling and has excellent detergent-dispersant action.

For further information write to the Shell Railroad Sales Department.

SHELL OIL COMPANY

50 West 50th Street, New York 20, New York
100 Bush Street, San Francisco 6, California
Shell Building, St. Louis 3, Missouri





Bendix CRC enables locomotive engineer to remain in constant communication with members of train crew, with other trains, wayside offices, and train dispatchers. In addition to handset being used by engineer, a small loudspeaker is provided over which calls are received.

Bendix Radio helps the ACL step up efficiency

Entire Western Division Blanketed with Bendix CRC (Centralized Radio Control) . . . Part of ACL's "Operation Radioize"



Western Division includes 476 miles, mostly single-track main line extending between Waycross-Manchester-Birmingham and between Manchester and Atlanta. Traffic on Waycross-Manchester section totals about 16 trains daily.

WITH a constant eye on increasing the efficiency of passenger service and freight movement, the Atlantic Coast Line radioized their entire Western Division. For this large undertaking, which gives the ACL one of the most advanced and complete railroad radio systems in the country, Bendix CRC equipment was used exclusively.

The ACL first ran a radio test using yard locomotives and base stations. The results proved overwhelmingly that pickup and switch-



Flagman on rear of passenger train uses Bendix Shoulder Pak to keep in constant touch with locomotive engineer. Both safety and efficiency are increased by using end-to-end radio communication.



Conductor on one of ACL's Western Division through freight trains uses train-to-wayside radio to expedite movements. Note Bendix Pack Set in lower left corner used by crew members when they leave caboose for switching or flagging operations.

ing time could be drastically reduced by using Bendix* Radio. The task of converting to radio control then got underway. Bendix Radio was installed on locomotives, passenger trains and on through and local freights. Seventeen wayside radio stations were built. These were placed 13 to 34 miles apart, putting every train within radio range at all times. Fourteen of these are operated on one or two shifts a day. Three are wholly unattended and are operated remotely by crews on trains or by dispatcher.

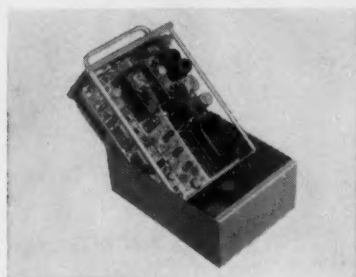
Bendix MRT-6 communication units were installed in duplicate in wayside stations. The change-over facilities are operated either by dispatcher by remote control or by wayside attendant. In addition, the ACL is the first railroad to make provision for a cut-over to a

message line circuit in event the dispatcher's telephone line fails.

Bendix Radio performs many other functions in modern railroading, as well. Bendix CRC helps eliminate bottle-necks. Knowing locations, conditions and speed of trains eliminates delays at interlocking plants or when entering and departing yards. Single tracks handle larger volume both ways. Better "meets" and changes of "meets" are possible. Train make-up and classification of freight are speeded. And many other operations are made easier by the use of radio.

Find out how your operation can be helped by Bendix Radio. Get the complete story by writing to Railroad Sales, Bendix Radio, Baltimore 4, Maryland.

*Reg. U.S. Pat. Off.



This Traffic Master contains power supply, transmitter and receiver in a single package unit. For use in locomotive, caboose or base station. Single or dual channel operation, 52-174 meg., 30 watt output.



The Bendix Pack Set is available 3 ways . . . as a Han Pak (above), Shoulder Pak or Back Pak. Designed especially for railroads, it features dual channel operation and provides big set performance in a small package.

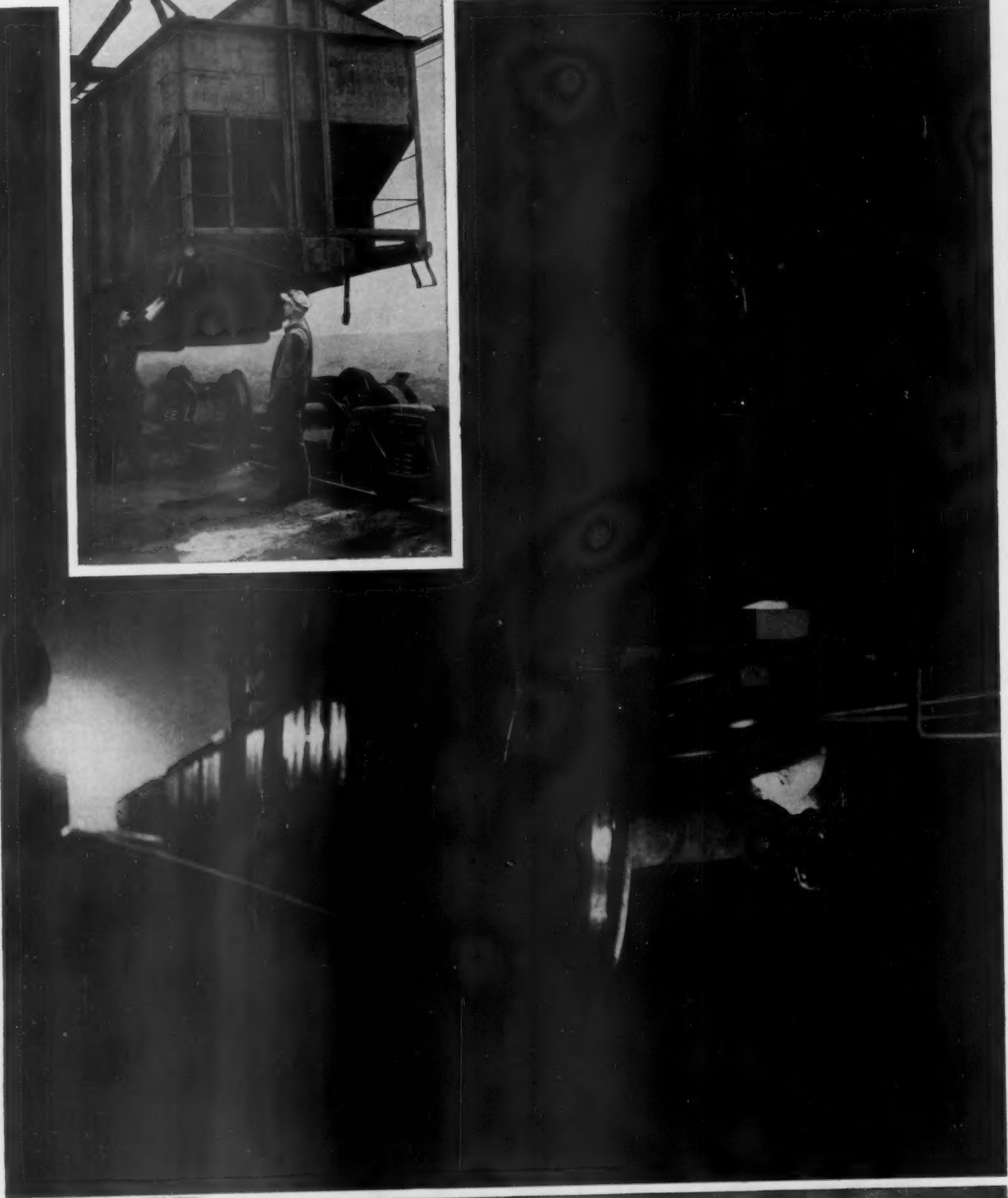


Bendix 2-Way Multi-Master can be used as a fixed station or mobile unit. Available in AC or DC current, 2½ to 35 watt output. Long-range, static-free reception.

DIVISION OF BENDIX AVIATION CORPORATION, BALTIMORE 4, MD.
Chicago Sales Office: 188 W. Randolph St., Chicago 1, Ill.
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Export Sales & Service: Bendix International Division, 205 E. 42nd St., N. Y. 17, N. Y., U. S. A.
Canadian Distributor: Aviation Electric, Ltd., 200 Laurentian Blvd., Montreal, Quebec.

Bendix Radio

HERE'S WHY



UNITED STATES STEEL

USS WROUGHT STEEL WHEELS

COST LESS...IN THE LONG RUN

USS *Wrought* Steel Wheels don't start piling up the savings until they've started piling up the miles. Then they deliver more ton miles per dollar than any other type of wheel.

No other wheel possesses as much mileage, or is so well prepared for heavy loads, hard braking, and high-speed impacts as USS *Wrought* Steel Wheels. Why? Primarily, because they are

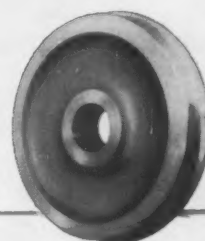
made of steel! Steel that is unmatched in hardness, strength, and ductility. Steel that is improved by forging, rolling, and controlled-cooling until it attains an unparalleled degree of soundness and wearability.

Here's how USS *Wrought* Steel Wheels cut your expenditures over the years:

LESS DEADWEIGHT

MORE CARGO

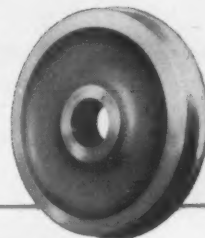
Because they are lighter than ordinary wheels of comparable size, there will be some saving of unsprung weight, which can be directly converted into payload capacity—or result in savings due to the decreased load. Another advantage—reduced unsprung weight means less pounding on the track system.



FEWER SERVICE INTERRUPTIONS

MORE SERVICE MILES

Because they last so much longer than ordinary wheels, a car equipped with USS *Wrought* Steel Wheels spends more time in service and less time on a repair siding, resulting in increased revenue to the railroad.

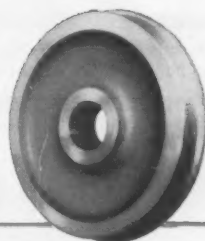


LOWER MAINTENANCE COSTS

HIGHER PROFITS

Elimination or reduction of labor requirements represents one of the best ways to save money today. Maintenance expenditures for cars equipped with wear-resistant USS *Wrought* Steel Wheels are considerably lower, as they require far less wheel servicing than cars with ordinary type wheels.

Two strategically located wheel plants are prepared to fill your orders for all types of Wrought Steel Wheels: McKees Rocks (Pittsburgh), Pennsylvania plant, serving the East and Southeast, and the Gary, Indiana plant, supplying the Western and Southern Lines.



SEE The United States Steel Hour. Televised alternate weeks. Consult your local newspaper for time and station.

UNITED STATES STEEL CORPORATION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

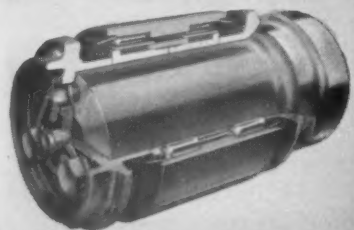
USS WROUGHT STEEL WHEELS



UNITED STATES STEEL

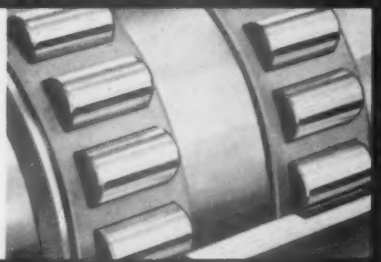
4 key reasons why are switching to the

1



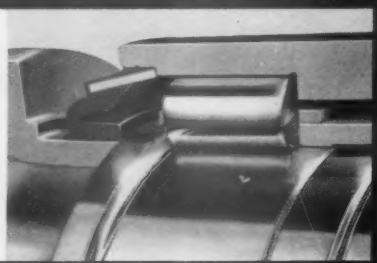
Simplified design assures lower installation costs. Only four parts on axle; all parts are interchangeable. No fitting adjustments.

2



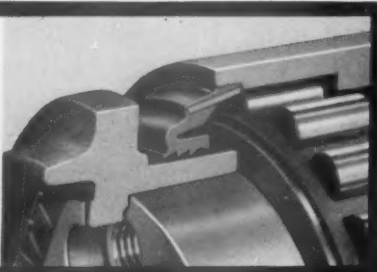
Big, husky straight cylindrical rollers, like those in all HYATT journal bearings, provide more load-carrying capacity, longer life.

3



Lateral thrusts are easily and efficiently absorbed by rugged oversize race flanges which locate and help guide the rollers.

4



Positive-type seals at both ends of the housing retain 3-year supply of lubricant, completely exclude dirt, water and foreign matter.

Here you see exactly *why* we say: The new HYATT Hy-Roll is so *simplified*, so *dependable*, so *economical* that it makes the big switch to roller bearing freight completely *practical* at last!

The Hy-Roll is the culmination of HYATT'S unequalled experience in building more roller bearings for American railroads than any other maker. Seventeen major lines have equipped thousands of freight cars with HYATT'S in recent years; 40% of all modern passenger cars and 70% of all diesel road engines have HYATT'S, too—every last one built with time-tested straight cylindrical rollers! The basic features of the new HYATT Hy-Roll have already been proved in millions of miles of high-speed service.

TOMORROW'S PROFITS DEPEND ON FORESIGHT TODAY

A freight car, unlike a highway truck, isn't worn out and replaced with a more modern model every few years. The fleets of freight cars being built today will still be rolling 10, 15 or 20 years from now. Be sure to equip your new cars with modern HYATT Hy-Roll Roller Bearings so they can return you maximum profit today and *remain competitive for years to come!* Call your HYATT Sales Engineer *now* — or write Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

**MORE HYATT ROLLER BEARINGS ARE IN USE BY
AMERICAN RAILROADS THAN ANY OTHER MAKE!**

With the addition of a simple wedge or frame adapter, the HYATT Hy-Roll fits both integral and pedestal types of trucks.



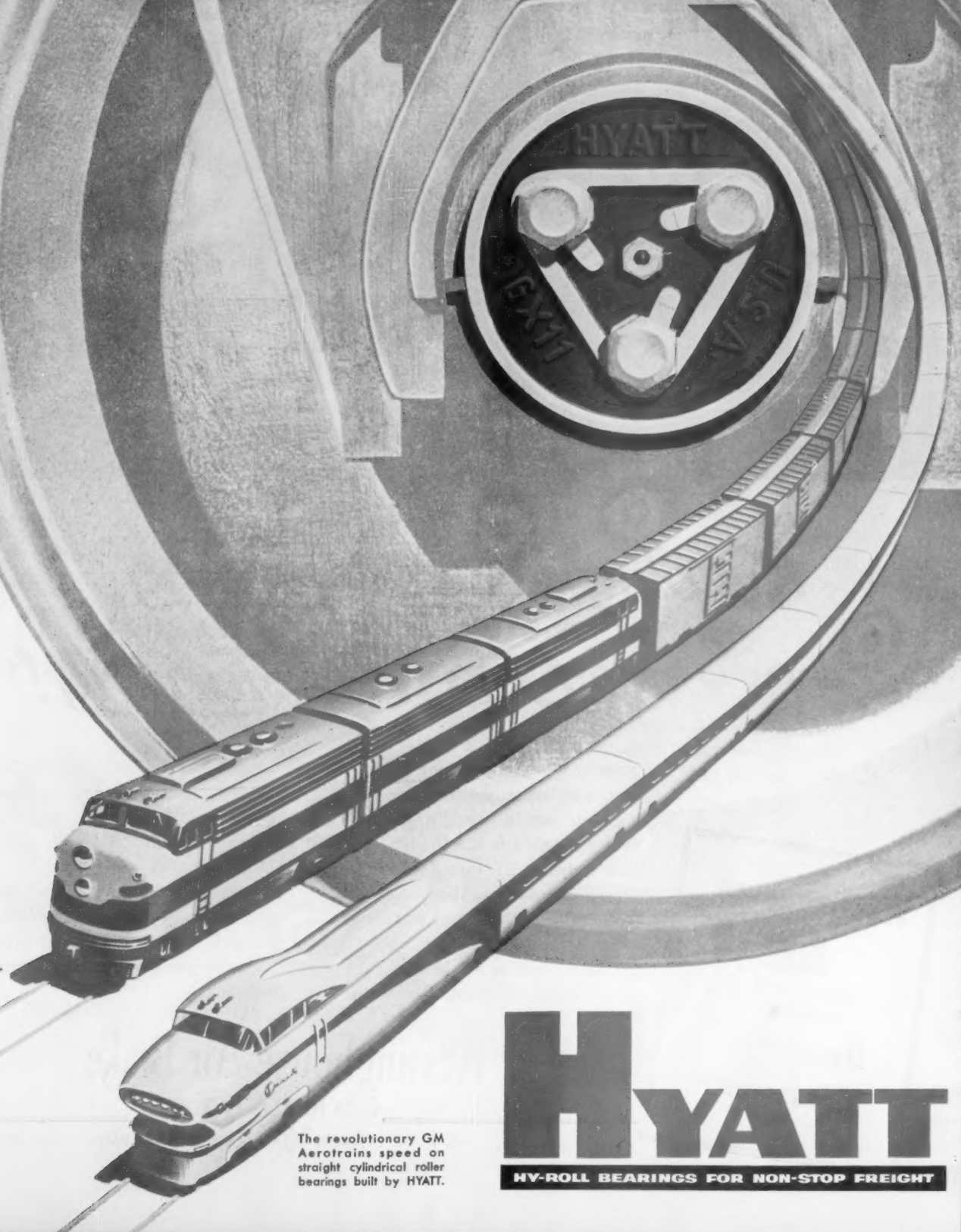
ONE BEARING FITS BOTH!

Another



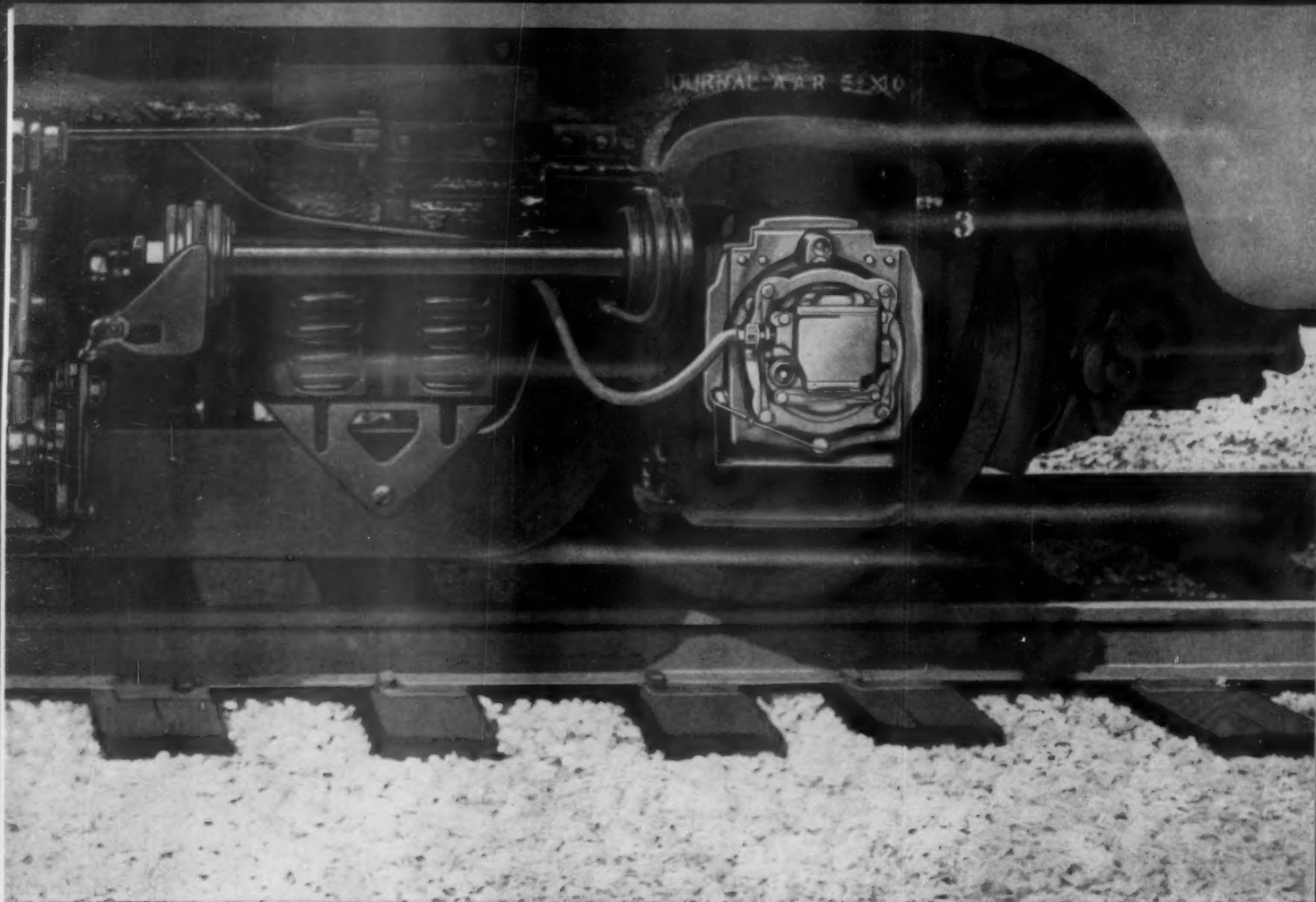
contribution to railroad prosperity

American railroads
new *HYATT HY-ROLL*
FOR FREIGHT CARS!



The revolutionary GM
Aerotrains speed on
straight cylindrical roller
bearings built by HYATT.

HYATT
HY-ROLL BEARINGS FOR NON-STOP FREIGHT



Keeping Wheels Turning Cuts RE-Turning!

Turning Wheels are *earning* wheels. When they're rolling on the track, they're playing their part in paying a return on the money invested in the equipment. When they're being RE-turned, it's a costly, time-consuming operation.

There's a practical way to keep wheels off the lathes and on the tracks . . . with the Westinghouse AP Mechanical-Pneumatic Decelostat® Controller. At the first

hint of a slip, the Decelostat Controller momentarily relieves braking pressure . . . permitting wheels to regain train speed . . . then, braking pressure is immediately built up to train level.

Because braking pressure is relieved the instant wheel slip *starts* . . . the slip is arrested *before it can* develop into a slide . . . and you save the cost of many flat wheels.

Westinghouse

AP

MECHANICAL
PNEUMATIC

**Decelostat®
Controller**

**Westinghouse Air Brake
COMPANY**

AIR BRAKE DIVISION **XX** WILMERDING, PENNA.

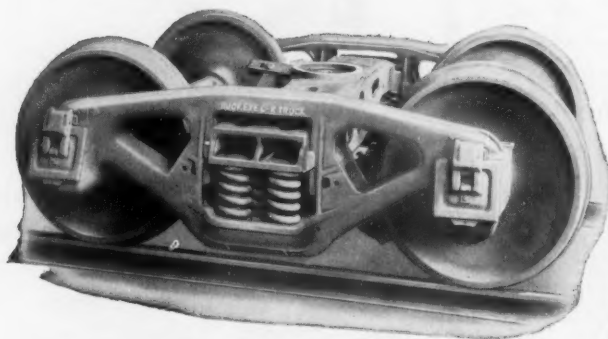
ANOTHER

Buckeye

EXTRA

..AT NO EXTRA COST!

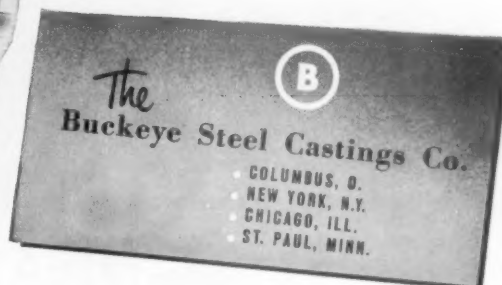
**ACCURATE UNIPLANE* JIG GRINDING
OF JOURNAL BOX LID FACE IMPROVES CLOSURE**



FOR COMPLETE INFORMATION . . CALL OR WRITE

Refer Adv. No. 11872

* First featured on Buckeye's
famed C-R (Cushion Ride) truck .
now standard process on all Buckeye
trucks with integral journal boxes.



Hard, wear resistant white iron, produced by chilling the molten metal at the perimeter of the mold.

Accurately controlled depth of chill—enough but not too much.

Elimination of stresses by annealing for 72 hours under controlled conditions.

Strong resilient gray iron, easy to machine, easy to mount on axle, easy on axle stresses.

tread section of a chilled car wheel



how performance is built into AMCCW Chilled Car Wheels

Well over 150,000,000 miles per wheel failure in recent years tells its own story of improvement in performance and safety. Note these other advantages that assure a permanent place for chilled car wheels in modern railroad equipment:

- low first cost
- low exchange rates
- reduced inventory
- short-haul delivery
- increased ton mileage
- high safety standards
- complete AMCCW inspection
- easier shop handling



Association of Manufacturers of Chilled Car Wheels

445 No. Sacramento Boulevard, Chicago 12, Illinois

ALBANY CAR WHEEL CO.
SOUTHERN WHEEL (AMERICAN BRAKE SHOE CO.)
GRIFFIN WHEEL CO.
ACF INDUSTRIES
MARSHALL CAR WHEEL & FOUNDRY CO.
PULLMAN-STANDARD CAR MFG. CO.
CANADA IRON FOUNDRIES, LTD.
CANADIAN CAR & FOUNDRY CO., LTD.

NOW...

400,000

CAR SETS!

Excuse us... please... our figures are showing again!

By March 1, 1956, our sales had *passed* the 400,000 mark. Actually, we now have sold 415,000 car sets of Barber Stabilized Trucks to more than 100 major railroads and private car lines in the United States and Canada.

We mention these new facts for *two* reasons:

- (1) There is no *better* way to convey to you the endorsement which the railroad industry has given our products; the leadership they have conferred on our company.
- (2) We're just plain *proud!* Standard Car Truck Co., 332 South Michigan Avenue, Chicago 4, Ill. *In Canada:* Consolidated Equipment Co., Ltd., Montreal 2.

Specify Smoother-Riding

BARBER
STABILIZED TRUCKS

TM *for mine drags*

...still another Promise

"The mine drag furnishes still another service where Train Master's 2400 horsepower is a dollar-saving value. Its high capacity means greater availability—because the Train Master can haul the same tonnage in one-third less running time than the conventional six-motor unit."

So ran the promise based on design performance figures on the Train Master almost three years ago.

...fulfilled on the Virginian



On-the-rail performance proved to The Virginian that Train Masters were the logical answer to its program of replacing freight steam power with diesel-electrics. In the short span of 13 months, its large order—and large reorder—completed that program.

Operating as single- and dual-unit locomotives, TMs handle all the tough mine service, heavy drag, switching and interchange service on the coal field division—fulfilling the promise that rugged quality, capacity and stamina would deliver high drawbar pull to keep tonnage moving.



FAIRBANKS-MORSE

a name worth remembering when you want the BEST



TRAIN MASTER

*your best
motive power buy*

...the record proves it!

If you would like a copy of the colorful and descriptive Train Master booklet, write: Fairbanks, Morse & Co., Chicago 5, Illinois.



AGRONYL R WEED CONTROL

**Test plots 3 years ago...
25,000 Track-Miles last year!**

From test plots to 25,000 track-miles a year ... in just three years! That's the impressive record of AGRONYL R, Socony Mobil's new type weed control. AGRONYL R is a product of Socony Mobil's Research laboratories ... was developed and perfected in cooperation with leading railroads on rights-of-way from the Gulf of Mexico to the Canadian border. It's a distinctly new kind of herbicidal oil, highly effective, and economical to use.

► Self-Application

Many railroad engineering departments are turning to *self-application* for weed control

for main lines, branch lines, secondary main lines and yard application.

► Advantages of Self-Application

These engineering departments have studied the problem of weed control and have found they can cut costs by self-application. Self-application can be made when desired and needed, and can be made when convenient to other maintenance schedules. *Weed control is being tied in with road-bed maintenance programs.* In this way, application costs are actually reduced! Shown below are examples of actual costs by *self-application*.



WORK TRAIN... a railroad reports an AGRONYL R application at \$7 per acre for the system including material cost, labor, and locomotive charges.*



SPRAY CAR (self-propelled) ... a railroad reports an AGRONYL R application at \$4.80 per acre for the system including material cost and labor.*



CONVERTED WEED BURNER... a railroad reports an AGRONYL R application at \$7.60 per acre for the system including material cost and labor.*



YARD TYPE CAR... a joint-agency operation reports an AGRONYL R application for yard control at \$13.90 per acre including material cost and labor.*

SOCONY MOBIL OIL COMPANY, INC., and Affiliates:
MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP.



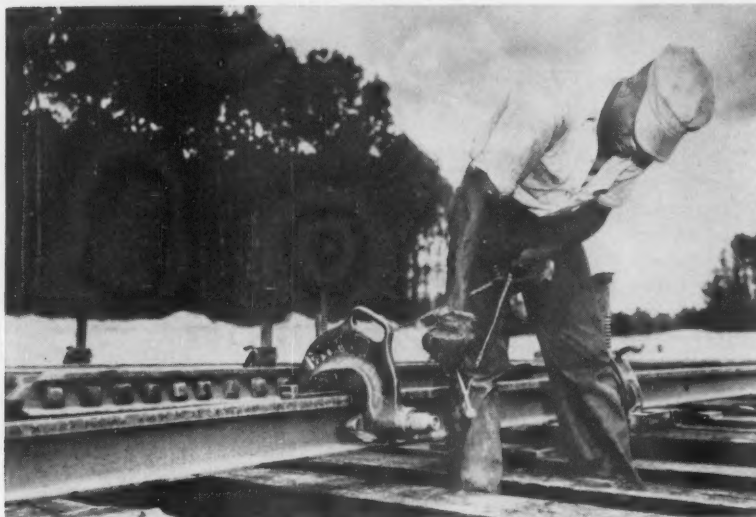
We will be discussing these results and costs of application in detail with you prior to your preparation of budgets for next year. However, if you desire information sooner, we suggest you write us for the data you require.



RAILROAD DIVISION

26 Broadway, New York 4, N. Y.
59 East Van Buren Street, Chicago 5, Illinois

*NAMES ON REQUEST

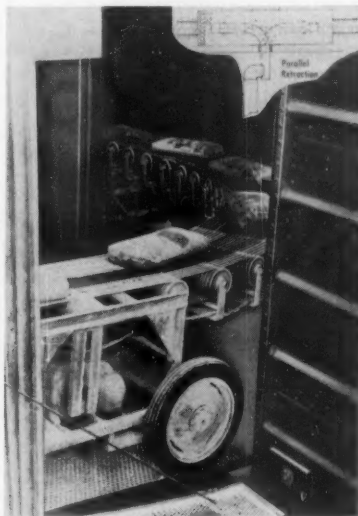


POWDER-ACTUATED RAIL PUNCH

Velocity-Power tools, including a powder-actuated rail punch, have been made available to railroads. The punch, which employs a cartridge-actuated plunger to push the punching unit through the web of the rail, is said to form holes for the immediate application of rail bonds or track bolts. The holes formed are said to be free of burns or other imperfections on either side, require no reaming or filing and have practically no taper.

The punch is available in two models. Model R-60 will accommodate rail sizes of 70 lb weight or less and form holes having a maximum size of $\frac{7}{8}$ in. Model R-110 is used on rails between 70 and 112 lb and will form holes as large as $1\frac{1}{4}$ in.

The frame of the punch is a simple steel casting and all other parts are composed of corrosion-resistant high-grade alloy steel. *Maintenance Equipment Company, Dept. RA, Railway Exchange, Chicago 4.* ●



BOXCAR LOADING SYSTEM

Featuring fingertip control, this power drive box car loader shuttles in and out of cars and trucks, eliminating hand trucking. It discharges bags and packages at desired elevation at point of final stacking.

The conveying arrangement is a series of steel spring belts operating over grooved rollers hinged together. The entire conveyor can be propelled, snake-like, through any curve or doorway on a radius as low as 6 ft.

As the loading progresses, the unit is withdrawn under power, without interrupting flow of bags or packages.

Conveying capacity is 30 bags per minute, automatically transferring

all the way from packing stations to point of loading. *Power-Curve Conveyor Company, Dept. RA, 2185 S. Jason st., Denver 23, Colo.* ●



PORTABLE TANK VENTILATOR

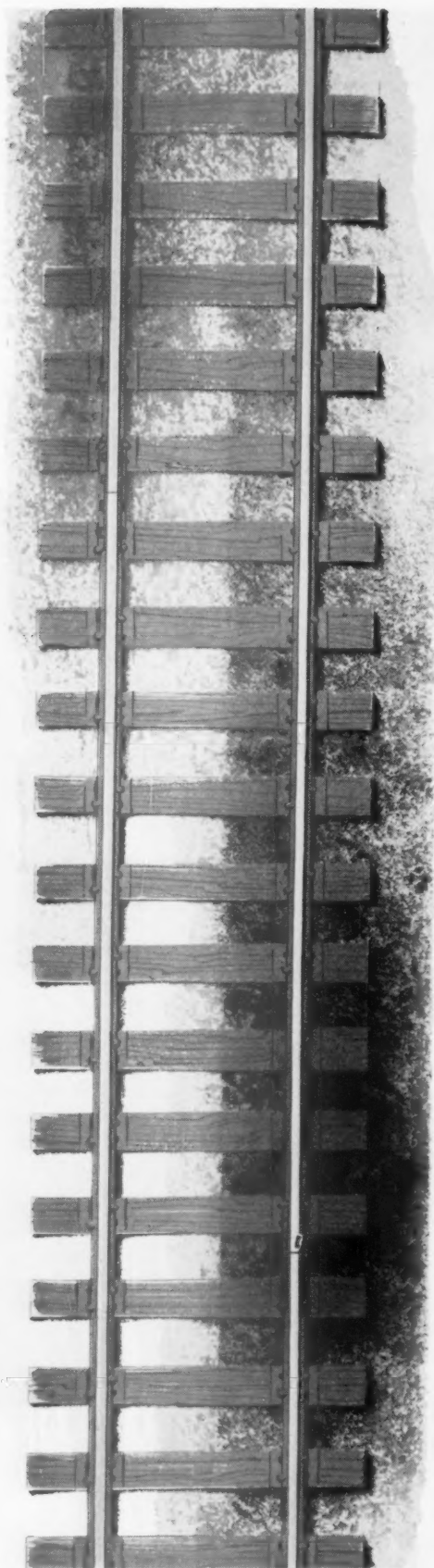
Cleaning and repairing railroad tank cars can be a difficult job if proper ventilating precautions are not taken.

On many jobs such as these, motor-driven blowers are impractical because of their weight, bulk and inconvenience. Offered as a solution for the problem is a lightweight device which circulates maximum quantities of air yet has no moving parts.

This device is a venturi-type, portable air mover. Called the M-S-A-Lamb Air-Mover, this device weighs only 31 lb but when operated on 60 psi air pressure it will move as much as 2,700 cu ft of air per minute. Operation is based on the venturi effect produced when compressed air is expanded at high velocity through an annular orifice and outlet horn.

The device has no motors, turbines, fans, or moving parts of any description.

As for transporting the air mover, one man carries it from job to job. *Mine Safety Appliances Company, Dept. RA, Pittsburgh.* ●



HOW TO PUT AMERICA'S MOTORISTS BACK ON THE LONG, STRAIGHT AND NARROW

Your single biggest competitor for passenger business today is the "between-city motorist." It's a fact! This year alone, he'll ride hundreds of *BILLIONS* of passenger miles—right off the tracks. Yet, alert railroad management has helped switch back millions of these miles with the Hertz-invented Rail-Auto Travel Plan.

You can help win back lost passengers with this tried and true plan by urging your colleagues to try it—sell themselves on its true, low-cost convenience.

You can urge ticket agents to repeat this profitable question:

"May I reserve a Hertz car for you at your destination?"

A bonus-incentive is paid them by Hertz—10% of total rental charges!

You can help Hertz promote rail-auto travel in your own advertising, and with free displays, signs and literature. Add to Hertz' tremendous national Rail-Auto Travel Plan promotion, you stand to gain!

You can join Hertz the leader—world's oldest and largest rent a car service—win new traffic with Hertz! And Hertz serves over 700 cities worldwide with thousands of sparkling, new Ford Fordomatics or other fine cars . . . honors millions of credit cards including your own! Interested? Call or write: Hertz Rent A Car System, Dept. D46, 218 So. Wabash Ave., Chicago 4, Ill.; phone: WEBster 9-5165. Ask for Hertz' Rail-Auto Travel Plan facts, forms and promotional material, today!

More people by far...use

HERTZ

Rent a car

That Treasure Hunt For \$700,000,000

The ICC investigation into the alleged "passenger deficit" offers a fortunate and timely opportunity for the advocates of economy in transportation to present evidence which will promote wider and deeper understanding of the basic principles involved in transportation cost analysis and transportation pricing. The inquiry likewise provides an equal opportunity for the professional befuddlers of public and official opinion on transportation issues to obtain a platform from which to spread additional confusion and misinformation.

Opportunity for Good—and Bad

It remains, therefore, to be seen which side will show the more enterprise and skill—the group interested in discovering and disseminating the facts of transportation economics, or the other one which profits from misunderstanding. Judging from past experience, there can be no easy assurance that the wisdom and righteousness brought to light by such an inquiry will inevitably outweigh the folly and self-serving mischief which will also be put on parade.

Actually, nobody knows for sure whether there is a "passenger deficit" or not; or, if there is one (as seems not unlikely), what its magnitude actually is. Still less does anybody know how best to overcome the deficit, if any.

An important question: Will the friends of economy in transportation really marshal fully the available resources of knowledge in this area—and put it at the disposal of the inquirers?

This investigation is directly concerned with \$700 million. Whether this colossal sum is actually being "lost" is highly questionable—but there is no question at all that, at the very best, there is a lot of money not being earned by the passenger business that ought to be earned. So the investigation, if thorough and fully competent, can scarcely fail to show the way to greatly increased earnings from the passenger business. Whether this route to improved earnings in passenger service, when discovered, will be a practicable one to follow—is another question.

The implications of this investigation go far beyond the passenger business, however. They will invariably encompass the fundamental economics of the whole range of transportation pricing. If sound principles are discovered for cost-finding (or cost-assignment) and

for pricing in passenger service, then it will inevitably follow that most of these principles will apply with equal force to the costing and pricing of freight service.

So this investigation is not an exclusive concern of the passenger department—although it will of course be of the greatest importance to that department. It will involve questions of far greater significance than the interests of any one department—embracing, in fact, the entire economic and pricing structure of the railroad industry. And not only of the railroads, but of all transportation.

Is it any longer practicable to maintain the degree of uniformity which still persists in passenger pricing—potentially profitable runs being relatively overpriced, to the disadvantage of their traffic volume, in the (usually vain) attempt to compensate for losses incurred from hopelessly unprofitable services?

When a losing train cannot be discontinued because of political or regulatory obstacles, then it follows that the service is being subsidized. If a service is going to be subsidized, is it less desirable to collect the cost of the subsidy from the communities benefited than from the railroad's freight patrons?

Fortunately, some able heads are already at work on the "passenger deficit" problem. J. B. Jones, vice-president, passenger sales and service of the Pennsylvania, in a recent address at American University set forth some of the basic issues involved, and copies of this address are doubtless available to all those with a professional interest in the question. Two able research scholars at the Harvard Business School have been working in this area for the past couple of years and should soon be in a position to reveal their findings.

Some People Know the Answers

There are some economists who have a lot of pertinent information to offer on questions of cost finding, cost allocation, and pricing. Two highly enlightening books in this field of inquiry have recently been reviewed in these pages.* If all the available erudition on this interesting and all important subject is brought out and spread around in the course of this inquiry, some of this wisdom is bound to get into circulation and find practical application.

Whether the missing \$700 million treasure trove is uncovered directly in the passenger service doesn't make much difference. It recalls the story of the old man who told his sons he had buried a fortune in a field. They dug for it hard, and found no buried treasure—but all their digging caused wonderful crops to grow in that field; so they got their treasure anyhow, but indirectly. And really comprehensive digging for the elusive "passenger deficit" of \$700 million might easily turn up some incidental benefits as big as the specific goal.

* "Economics of Inland Transport" by A. M. Milne, *Railway Age*, March 19, p. 70; and "La Situation Financière de la S.N.C.F. et la Coordination des Transports" by Paul Coulbois, *Railway Age*, Jan. 30, p. 32.

STORY AT THE SOURCE



Presidents Shoemaker (left) and Johnston give the answers . . .

"WILL THE DL&W-ERIE COORDINATION PROJECTS SET A

Pattern for the Industry?"

Observing marked progress in attempts by the Lackawanna and the Erie to work out common use of duplicate facilities, *Railway Age* wanted to get the background of their "novel" program. What factors make such inter-road cooperation possible? How

could other roads with similar potentialities benefit from the Erie-DL&W experiments? Members of this paper's news staff interviewed Perry M. Shoemaker, president of the Lackawanna, and Paul W. Johnston, president of the Erie, to get this story "on the record."

What was the origin of the plan for the Erie to abandon its Jersey City passenger terminal and enter joint use of the Lackawanna's Hoboken facilities?

JOHNSTON: It was the outgrowth of studies originally undertaken by the two railroads in an attempt to find some way to mitigate our very sizable commuter losses. We felt we were very fortunate in finding a solution that would at least be partially helpful in that respect and at the same time, we believe, be well received by the public.

Precisely what does the public stand to gain from the coordination?

SHOEMAKER: We have gone through a period of years when most suburban railroads, incurring large losses, were attempting to reduce those losses by drying up their service. This has been disturbing—seriously so—to our continuing patrons. The public stands to gain by greater assurance of continuity of service. Additionally, ferry service will be more frequent and Hudson Tube service more convenient for passengers.

JOHNSTON: From the standpoint of Erie passengers I think there are additional advantages because of the nature and location of the Lackawanna facilities. There is much more ready access to the Hudson & Manhattan at the Lackawanna station than at the Erie Jersey City station. The Lackawanna ferry is located closer to the tip of Manhattan where a very sizable portion of our commuters work. I might add that it gives both Lackawanna and Erie commuters far greater assurance of continuing ferry service, since both

railroads had high deficit ferry operations which they would individually try very vigorously to give up were it not for the coordination.

Have your roads been involved in such "drying up" activities?

SHOEMAKER: The Lackawanna's 23rd Street and Christopher Street ferries have been closed; the Erie has closed its 23rd Street ferry; train service adjustments have been made, largely downward, as passenger train travel has become more and more concentrated in the rush hours.

Has this created particular problems?

SHOEMAKER: Yes. This provides a peaking of expenses as the entire fabric of suburban operation—ownership in cars and locomotives, train crews, and car cleaning facilities—all revolves around meeting this peak requirement for 15 to 20 hours a week. That doesn't give good utilization of manpower, facilities or equipment. Now, if the two railroads can successfully achieve better utilization of facilities, the public stands to gain by greater assurance of continuity of service than obtained by each railroad trying to work out its own salvation.

Can Hoboken Handle Load?

Will the additional passengers from the Erie overtax the DL&W facilities?

SHOEMAKER: It is very interesting that the total number of passengers involved in this entire project is only slightly more than the Lackawanna alone had during the peak of its commuter traffic in 1933. We handled then about 33,000 passengers daily. Now the combined passengers of the two railroads to be handled through the one facility are but little more.

How will train schedules be affected?

JOHNSTON: There is not contemplated any reduction in the number of trains and the changes in schedules will be very, very minor.

SHOEMAKER: That's right. The integration of the schedules during the rush hours works out with no difference greater than three minutes over the existing schedules of the railroads separately.

About how many trains will use the terminal daily, weekdays?

SHOEMAKER: About 400 revenue trains.

Is there any hope for break-even commuter operations resulting?

JOHNSTON: I very much wish so, but not even under the most wishful thinking can we conceive that that is going to happen.

SHOEMAKER: This clearly involves just a reduction of losses.

JOHNSTON: Of course it is no solution, but it eases the pressure on a problem for which we have not yet found the answer.

What is involved in the ferry service changes you referred to?

SHOEMAKER: The Lackawanna has a four-boat operation in rush hours which gives service about every 7½ minutes. There is considerable excess capacity on those boats and the studies indicate that a five-boat operation can be expected to satisfactorily handle all the passengers from both railroads with a five-minute headway. It is proposed to take over one, and perhaps even two Erie boats, after making some minor modifications so they will fit the Lackawanna slips.

What Changes Must Be Made?

How much remodeling of terminal facilities is involved?

SHOEMAKER: It does not involve a major reconstruction of the terminal. Our 17-track station will handle the trains of both companies. Some enlargement of the mail and express facilities is necessary. The Lackawanna storage yards are not adequate to store the Erie suburban and through trains during the day, in addition to our own, so that situation would be met operating-wise by most Erie equipment going back to the Erie yard at Monmouth street, a new connection being built from the Lackawanna facilities to the Erie's Weehawken branch to make this possible. Some Lackawanna equipment will be moved out during the day to South Orange or Montclair, which are comparatively nearby yards, for overnight storage of equipment.

Who will do the terminal switching in the joint operation?

SHOEMAKER: It is contemplated that the Lackawanna will do the terminal switching as such, and that Erie employees will back their trains from Erie yards into the Lackawanna station and take the empty equipment to the Erie yards as they do now.

Will the coordination cause much reduction in personnel?

SHOEMAKER: It will involve some increase in Lackawanna personnel because of the switching of certain trains, particularly the making up of through trains and handling cars from and to mail facilities.

JOHNSTON: The object of the coordination is to reduce the present loss. With no reduction in trains proposed, the reduction in loss can only be made through elimination of duplicate facilities involving both labor and material. There will be some reduction in personnel on the Erie.

Will displaced Erie personnel be hired by the Lackawanna?

JOHNSTON: Under the terms of the Washington agreement there is provision for just such purposes and for protection of displaced employees. In actual practice, though, the Erie is hiring almost constantly more employees than will be displaced, so probably very few people will be out of work for more than a very short time.

You mean that any surplus manpower will be absorbed elsewhere on the Erie?

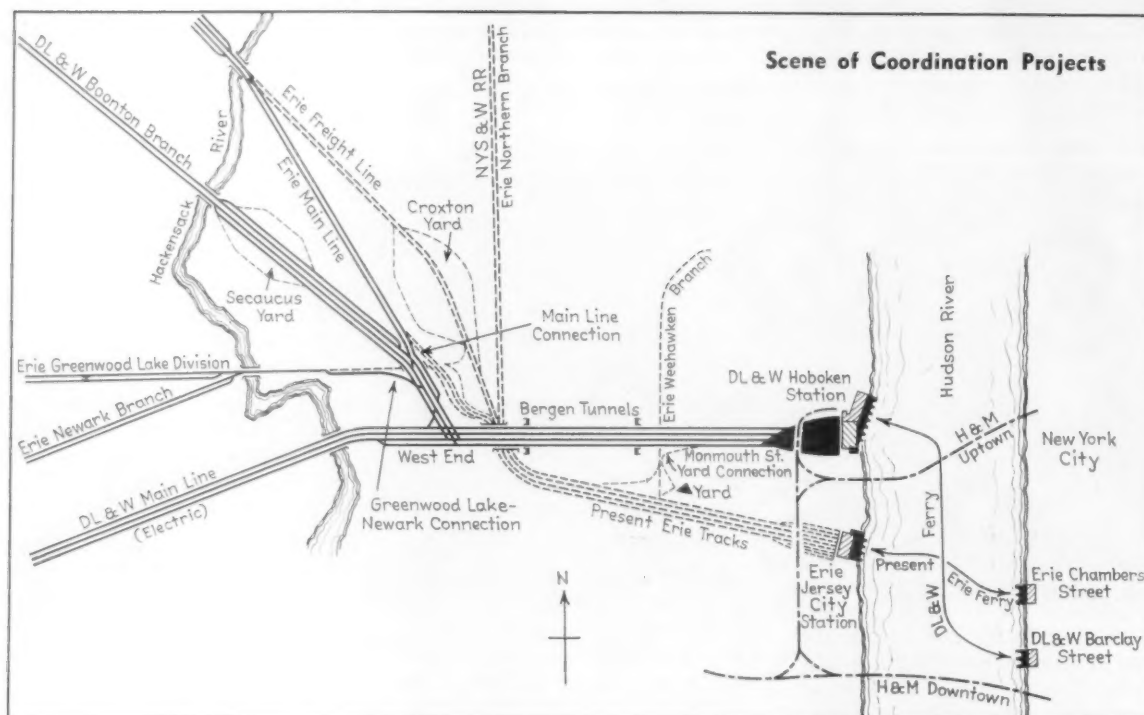
JOHNSTON: I mean pretty much in the same locality, because turnover in employment and availability of work is very high at this time.

Unions Are Kept Advised

What has been the attitude of the brotherhoods on this coordination?

JOHNSTON: I think that the answer to that is that the railroad managements and the heads of the various labor organizations executed the Washington agreement in good faith. This places both of us in the

" . . . If the two railroads can successfully achieve better utilization of facilities, the public stands to gain by greater assurance of continuity of service. . . "



position of going ahead in good faith and working out the details of the coordination under the provisions of the agreement.

Have there been any specific discussions with labor leaders so far as this immediate arrangement is concerned?

JOHNSTON: We and likewise, I understand, the Lackawanna have been very meticulous to keep our employees informed as these studies have progressed, as to both our overall planning and scheduling.

SHOEMAKER: As a generalization, the labor unions have been cooperative. There was no difficulty on either railroad in working out the two coordinating projects already consummated, namely the freight stations operated jointly at Binghamton and Elmira. The brotherhoods were kept fully informed of the studies as they were in progress, so that they did not wake up to a new decision coming on them overnight.

JOHNSTON: This is not an obligation under contract, but to us is just a matter of good management-labor relations.

How much will the Hoboken coordination cost?

JOHNSTON: The figure has been

estimated at more than \$2 million for the two companies. We also expect to realize savings of about that amount.

How is that broken down?

SHOEMAKER: Besides the things the Lackawanna has to do at Hoboken, the two railroads, jointly, are making new track connections between the Erie's main line and the Lackawanna's Boonton branch, and between the Erie's Greenwood Lake branch and the Boonton branch.

JOHNSTON: There will also be expenditures for signaling to make the operation more flexible.

How about for mechanization of baggage handling and other facilities?

SHOEMAKER: Conveyors and baggage trucks are planned for mail handling operations, and mechanized equipment and enlargement of facilities are planned for the express operation.

How Will Costs Be Shared?

How much of that sum would be borne by each road?

SHOEMAKER: Essentially this is a partnership operation involving potential savings which neither railroad could make without the other. We

are each initially making such capital expenditures as are involved on our respective properties. When the final accounting takes place, if there is an imbalance of capital expenditures, it will be capitalized and charged against the overall savings as an expense.

Is there any precedent for such an arrangement?

JOHNSTON: I think this is a rather novel procedure in the railroad industry and our ability to proceed with this project promptly is a direct result of a willingness on both sides to handle the negotiations this way.

Do you think this sort of coordination is possible between other railroads?

SHOEMAKER: Without question.

JOHNSTON: Much of the difficulty in accomplishing these coordinations has been the long and sometimes fruitless discussions as to costs and savings. The net result has been that after accountants' figures have been prepared one railroad or the other has felt that it has been placed at a disadvantage and the coordination has not progressed. I feel there are many possibilities of this kind if they are approached the way the Erie and

the Lackawanna have approached this particular problem.

SHOEMAKER: To button it up, it amounts to this: after all the additional expenses, capital and otherwise, have been met from the savings to be made, then those savings will be shared between the two companies.

What has enabled the Erie and Lackawanna to accomplish so much where other roads, you say, have bogged down?

JOHNSTON: In my opinion, it is a matter of mutual confidence, and this was basic throughout our negotiations.

SHOEMAKER: That was an important ingredient; and you also had this situation: both railroads, though competitive, have been finding it more and more difficult to achieve satisfactory net incomes in the face of rising costs. Each has been exhausting its ingenuity to provide better service with greater economy. Our roads closely parallel each other from New York to Buffalo. There is every geographical opportunity to look hard at the potentialities of working out combined operations, assuming approval from the regulatory bodies as a commonsense arrangement.

What Else Is Planned?

Do the Erie and Lackawanna have other coordinations in prospect?

JOHNSTON: Two have already been consummated in the joint use of freight station facilities at Binghamton and Elmira, using the Lackawanna facility at Binghamton and the Erie station at Elmira.

How about for the future?

JOHNSTON: There is the possible joint use of trackage and stations between Binghamton, Elmira and Corning, all in New York. It's probably our number two project.

Is that under study now?

SHOEMAKER: That is under active study. We've reassigned some personnel from each company as a study committee to see how the coordination may be effected.

JOHNSTON: The Binghamton-Corning project is not as big as the Hoboken matter, but it's far and away the next biggest thing we're studying.

SHOEMAKER: That's right. Between Binghamton and Corning each road has about 80 miles of double track. At many points a stone can be thrown from one line to the other. We each have passenger stations in several cities and feel our operations can be served, probably better, from common stations, and that we will benefit by greater utilization of trackage and reduction of the total trackage in that area.

Do you plan any integration of crews or equipment?

SHOEMAKER: Not as programmed at the present time.

Which lines will be retained between Binghamton and Corning?

JOHNSTON: No determination has been made but we might wind up using certain properties of one road and certain properties of the other.

SHOEMAKER: Both railroads have industries scattered up and down this area which obviously must be protected.

JOHNSTON: It is somewhat like a game of checkers to see what is the best way to move.

Shift to Begin About July 1

Have any target dates been set for the Hoboken move?

JOHNSTON: The plan is to take the through and off-hour trains out of Jersey City as near July 1 as possible, and the commuter trains by November 1, but this will depend largely on the promptness of decisions from the regulatory bodies.

How about the Corning-Binghamton project?

JOHNSTON: I think the only target there is to do it as quickly as possible and in the proper fashion.

Are there other possible areas for coordination?

SHOEMAKER: Under study are parallel stretches between Wayland and Corning. Also, the Erie has two

routes into Scranton. There may be some possibilities in that area, but our forces have been so busy on these other projects that these have not been even casually investigated yet.

JOHNSTON: There is a matter of scheduling involved but we will explore every conceivable area where there are possibilities of this kind.

SHOEMAKER: That is likewise true of our adjacent freight terminals at Buffalo.

Is there any coordination in New York harbor contemplated in view of the Lackawanna's purchasing five standard-type tug boats?

SHOEMAKER: Our tug boat fleet had to be modernized in any event, but integration of the operating features of the two marine departments is close to completion. It is planned to have one dispatching group control the harbor movements of both companies.

Gentlemen, does this series of coordinations suggest the prospect of merger between the Erie and Lackawanna?

JOHNSTON: No. Merger involves tremendous long-range problems involving securities, mortgage maturities, stockholder approval. Our sole objective is to make some immediate savings in areas where we are experiencing heavy losses. I don't think this implies that we either believe or disbelieve in the principle of railroads merging.

SHOEMAKER: Your question is understandable, thinking of some of the things that have historically characterized railroad mergers. The point here is not one of merger, but merely that in the commonsense operation of our respective businesses we see an opportunity to improve our service and operate more economically. Now, if such projects can be worked out successfully, why complicate the matter with questions of merging the two companies and raise issues that are not only not involved here at all, but might well delay the real accomplishment of savings indefinitely?

" . . . Essentially this is a partnership operation involving potential savings which neither railroad could make without the other. . . "

Do Cheaper Fuels Lower Costs?

Going into today's diesels are petroleum products which would have been unusable a short time ago. Cracked distillates, distillate blends, furnace oils and blended residuals are all offered to cut fuel costs—Each presents problems to be studied by the potential user

Small savings on every gallon of diesel fuel used can add up to large amounts of money for almost any railroad. At present there is a great deal of work being done with oils which cost less per gallon. When they are used, however, there can be additional problems. These can be questions of supply, combustion, engine wear and lubrication. All of them must be considered in determining which fuel is, in the long run, the most economical.

Before World War II diesel builders recommended and the railroads used straight-run distillates with a cetane rating of 50 or higher. After the war less straight-run fuel was available and the number of diesel locomotives went up rapidly. Railroads, engine builders, and oil companies worked together to find ways to use cracked distillates or blends of cracked distillates and straight run material as diesel fuel (*Railway Age*, Aug. 8, 1955, p. 48). It was found that fuels with cetanes even below 40 could be successfully used. Recently a survey of 23 roads showed that only 40 per cent of their 1954 fuel consumption had a rating of 50 cetane.

The use of lower cetane fuels has held down diesel oil cost per gallon. It was but the first of a number of methods which are doing this. There has been considerable confusion resulting from reports by "economy" fuel users. The Railway Club of Pittsburgh recently had the terms defined and the problems outlined in this complicated field in a discussion of "economy" fuels by H. V. Messick and F. M. Moffitt of the Ashland Oil & Refining Co.*

*Mr. Messick is technical advisor, diesel fuel and lubricants, and Mr. Moffitt is manager, national account sales, of the Ashland Oil & Refining Co.

With this article *Railway Age* inaugurates a series dealing with various aspects of the question stated here, viz. Do Cheaper Fuels Lower Costs?

Railroads east of the Rocky Mountains have been using diesel fuels with ratings known as Qualities A, B and C. Quality A fuel is 50 cetane or better. Quality B is 45 to 49 cetane, and Quality C is between 40 and 44 cetane. Generally distillation range, viscosity and pour point remain within ASTM D-2 specifications. Ashland generally does not classify Quality A, B or C fuels as economy types. As explained to the Pittsburgh organization, "Fuels below Quality C—below 40 cetane—or fuels that might have characteristics which disqualify them as ASTM D-2 fuels, such as fuels with abnormally high pour points, we consider as real economy fuels. An economy fuel, then, is a fuel which may present additional handling, storage or operating problems to the railroad customer, but is available in volume from a refinery.

"To call No. 2 furnace oil an economy fuel when it is available at a discount in summer months compounds the confusion. If the No. 2 furnace oil has the characteristics of a Quality B or C fuel, it does not become a true economy fuel when sold at a discount. Oil suppliers who try to move their furnace oil from their refineries and terminals into customer storage at special prices in the summer are not providing economy fuel, even though it may be offered under that name.

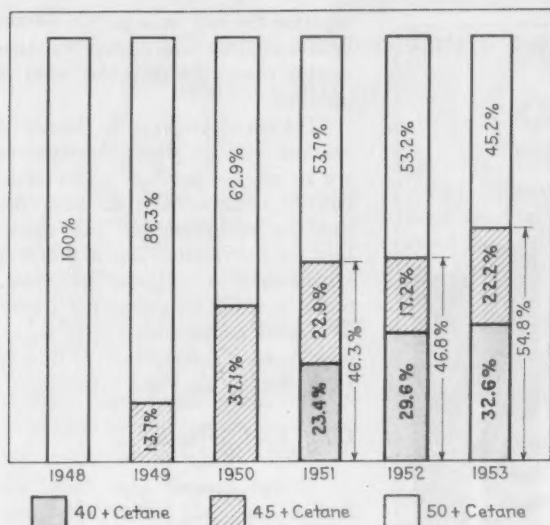
"Take the instance of an oil supplier who loses business to another competitor who is able to deliver a true economy fuel. The true economy fuel does not measure up to all of the specifications of an A, B, or C fuel or the requirements of ASTM

D-2 specifications. The competitor has the economy fuel available and the railroad customer can take the trouble and do the things necessary to make the fuel acceptable—at a price. Now, if the first supplier, who cannot make an economy fuel, decides to deliver completely satisfactory diesel distillates in the 40 to 50 cetane range at reduced prices to meet his new competition, the buyer is only confusing the issue when he insists on labeling these distillates at lower prices as economy fuels.

"Competition is good for all of us. As refiners and oil suppliers we must always be alert to what our competitors are doing. We add to the confusion, however, if we mislabel A, B or C fuel as economy fuels. For example, if we say that a furnace oil of satisfactory characteristics is an economy fuel in the summer when the price may be lower and is no longer an economy fuel in the winter when demand catches up with furnace oil supply, we will make it difficult to evaluate economy fuels.

"To evaluate fuels we have to know more than the price per gallon. We have to know how the fuel performs in our equipment—what are the specifications—what effect it has on our maintenance and servicing problems. All of these factors must be considered in evaluating fuels.

"The fuel picture is changing constantly. Some eight or nine years ago, following changes in refinery technology, Ashland Oil and other oil companies, in cooperation with engine builders and railroad customers, proved that fuel oils in the category of No. 2 furnace oil are satisfactory for the railroad industry.



GROWTH of railroads' furnace oil purchases after 1948 meant that more and more diesel locomotives have been using low cetane oils.



DUAL FUEL SYSTEMS on locomotives might require additional stationary installations for storage and handling of fuels. Residuals may need steam heating so that they can be successfully pumped to the locomotive.

"Ashland operates one of the largest fleets of diesel propelled motor vessels on the inland waterways. As a diesel engine operator, it is desirable to develop low cost fuels that will give satisfactory engine operation without expensive engine alterations or modifications. By early 1950 we had determined what approximate limits could be tolerated within the range of characteristics of diesel fuels for our operation. This work led to the development of an economy fuel that was found satisfactory in our diesel fleet.

"After proving the economies available with this fuel in our own fleet, we did not hesitate to recommend it to our railroad customers. We had five years of operating experience with the economy fuel before we offered it to a single customer. Not every customer could use the fuel. Only customers with access to the refineries producing these economy fuels could take advantage of them. If increased freight charges ate up the savings in fuel costs, it would not pay a railroad to switch to our economy fuel.

C&O Experience

"This economy fuel has now been in use on the Chesapeake & Ohio for exactly one year. It has used millions of gallons. It is not A, B or C diesel fuel selling at a lower price. After a full year's operation the C&O

has found that the fuel is entirely satisfactory—even during winter months—although you would expect some handling difficulties during very cold weather with a fuel having such a high pour point.

"While the interest in economy fuels has been spurred on by the efforts of the railroads and the oil industry, not all railroads can make the savings claimed for certain operations. Some time ago, one railroad reported phenomenal savings in fuel costs by going to a so-called economy fuel.

"This railroad changed from a No. 1 or an extremely light diesel fuel, to fuels in the Quality B and C range. The price differential between the two products, at that time, was greater in that railroad's area than it is here in the East.

"The reported savings in fuel cost brought this railroad nationwide publicity. When Eastern railroad managements heard of these savings, they naturally demanded similar savings from their purchasing and operating departments. But many of the Eastern roads had been using Quality B and C fuels for several years.

"Under these circumstances, what could you do? Plead guilty to not having a good publicity department and explain that your road had taken advantage of B or C fuel long before this blast of publicity. Or explain that, at the time, the price spread

between the light and heavy distillate fuels was much smaller in the East?

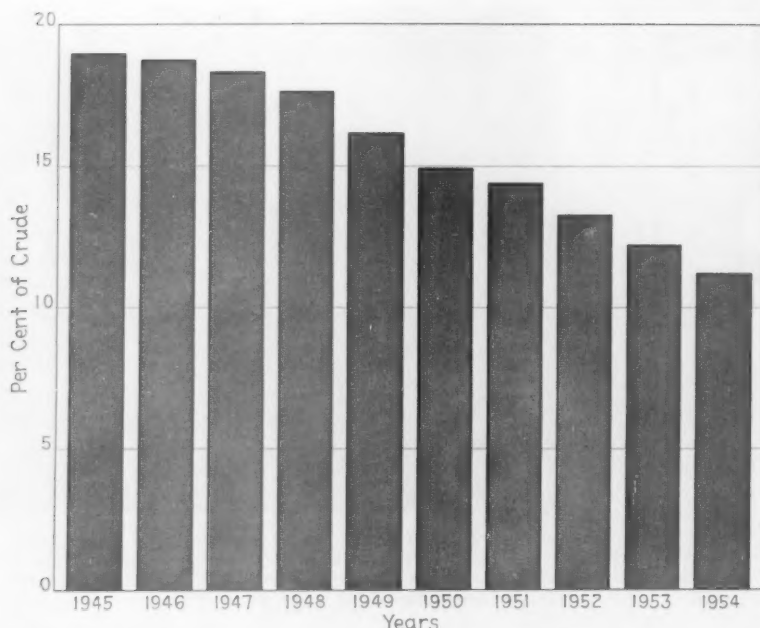
Today—Residuals

"Today's railroad operating man has to become familiar with the latest entry in the field of economy fuels. These are the blended residual fuels. You're going to hear a lot more about them in the coming months.

"Distillate fuels are those which are removed from the crude by the process of vaporization or distillation. Fuels such as you are familiar with are in the medium-heavy classification. Residual fuel is a liquid or semiliquid product containing asphaltic hydrocarbons and is the residue from the distillation of petroleum.

"Residual oil can be sold as a fuel for large industrial plants (particularly steel plants), converted into asphalt, or processed further in coking plants that drive off the lighter hydrocarbons and leave petroleum coke as the final residue.

"In 15 Midwestern states, the level of residual fuel production has not kept pace with increased refinery runs. This is principally due to catalytic cracking and the increased use of coking plants. As a result, during the past nine years, the yield of residual fuel has decreased from 19% to 11% of the crude runs in this area. While relatively less residual oil is produced in this area, the



RESIDUAL available from each barrel of crude refined is declining in the 15 state area from Ohio to Oklahoma and North Dakota. Changes in refinery technique sparked by increased demand for distillates did this.

demands by industry have continued to rise.

"The prospect of increased highway construction means that more and more residual fuel will be converted into asphalt. Add this demand for asphalt to the increasing demands of the steel and other industries and it is no wonder that residual fuel in northeastern Ohio is approaching the price of regular diesel fuel. In fact, the industrial plants in this vicinity are so hungry for residual fuels that they import the product from Gulf Coast refineries and from the East Coast.

"In the area bounded by Chicago and Pittsburgh—from the Great Lakes to Tennessee—there is no immediate prospect for an oversupply of residual fuel at phenomenal savings.

"Bear in mind the economic facts as they relate to supplies and prices in the great midcontinental area of the United States. The residue out of the crude oil barrel is not a waste product. It can be converted into

asphalt, industrial fuel, coke or residual fuel oil.

Using Residual

"Suppose that there were available supplies of residual fuel oil at economical prices along the right of way of your road. The quality of residual oil available will vary from refinery to refinery. The viscosity may differ as much as 3,000 seconds. Even the characteristics of residual fuel oil from a single refinery will vary with the season of the year. When the refinery is maximizing gasoline yields, the residual left will be different from the residual when running to maximum light fuel oil production. Stationary diesel operators who use residual fuel oil complain about the variations that occur in the characteristics of residuals—even when they come from the same refinery.

"With residual fuel available, how do you convert your equipment to take advantage of the savings in fuel costs? The roads which have used residual fuel in diesel engines have

reported the fuel savings. We do not have complete information on conversion costs. We do know what is involved.

"The major problems in the use of residual fuel in diesel locomotives are to get the product to the combustion chamber and to have the handling equipment and heat necessary for the residual fuel to perform satisfactorily in the diesel equipment. Since residual fuels flow too slowly at normal temperatures, it is necessary to heat the residual to thin it for easier handling and injection.

Dual Fuel Systems

"At the present time there are several dual liquid fuel systems being adapted to locomotive service. All present systems require separate distillate fuel storage systems on the locomotive. Generally, the main diesel fuel tanks are used to store the residual fuels. The distillate fuel is stored either in a compartment of the main diesel fuel storage tank or in a separate small tank which is sometimes placed in the nose of the locomotive.

"One system confines the use of residual fuels to throttle positions above RUN 5. Below throttle position 5, distillate fuels are used. Another system proportions distillate and residual fuels together so that at different throttle positions the engine is fed straight distillate, straight residual, or a combination of the two. Another dual liquid fuel system requires the controlled application of heat to govern the viscosity of the residual fuel. Enough heat is applied to permit easy atomization of the heavier fuels.

"Experiments thus far have shown that diesels do not idle satisfactorily on fuels heavier than the conventional A, B, or C diesel fuels.

"The added cost of special fuel systems on the locomotive can be sizable. One locomotive builder estimates that it would take 18 months of operation to recover the costs if the fuel savings were as high as 3.5 cents per gallon. To this must be added the cost of storing two prod-

"To evaluate fuels we have to know more than the price per gallon. We have to know how the fuel performs."

"There is no immediate prospect for an oversupply of residual fuel at phenomenal savings."

ucts instead of one. This can mean duplicate storage tanks as well as added equipment to heat the heavier residual to get it out of the storage tank during cold weather.

"While the additional cost of special storage tanks, heating storage tanks, and the cost of dual liquid fuel systems can be established, little information is available on how residual fuels affect maintenance and engine life.

"It is well known that heavier or residual fuels generally have higher sulphur content than distillate fuels. Increased sulphur content can increase wear at a phenomenal rate. One railroad in the East tested two distillate fuels under controlled conditions. One was a fuel with 0.25% sulphur, the other with 0.75% sulphur. The wear differential with the 0.75% sulphur fuel was four times greater than the 0.25 per cent fuel. On the other hand, residual fuels of around 2.0 per cent sulphur content are being used in locomotives with dual liquid fuel systems on the West Coast. Incomplete initial reports seem to indicate that this amount of sulphur does not increase wear proportionate to the increase in sulphur content.

Information Lacking

"At this time, little information is available on comparative wear on piston rings and valves. We do know that high sulphur contents cause increased wear. In fact, experiments have shown that cylinder liner wear is lineal to the amount of sulphur in the diesel fuel. Experiments have also shown that high sulphur content fuels are very detrimental to the lubricating oil and can cause an actual additive depletion of the lubricating oil. Most residual fuels contain vanadium which has been identified as a source of valve failure and corrosion.

"Fuel economy will have to be balanced out against the added cost of equipment, maintenance costs, and engine life before any true evaluation can be made of the net savings possible through the use of residual fuels.

"All railroads are interested in these residual fuel developments in diesel locomotives. The oil industry, too, has an important stake in this development.

"In all these discussions of economy fuels, the engine builder is moving with extreme caution. The engine builder, more than anyone else, is conscious of the maintenance problems that arise when degraded fuels are used in diesel locomotives. He asks for the assurance of uniform quality in fuels and lubricants so that the locomotives he builds will have a long life and give good service.

"The use of heavy or residual fuels is bound to affect the service life of the locomotive. The question is how much?

"If a differential of two or three cents a gallon between distillate and residual fuels is available, the railroad may find it can stand the increased equipment and maintenance costs. If the price advantage is reduced to one per cent or a little more, the additional expense for equipment and maintenance may not be warranted. A drastic change in fuels may involve lubrication, maintenance and service problems that could be very serious. What looks like an immediate advantage at first glance, may turn out to be no advantage at all on further study or when viewed long-range.

"Which brings us back to the question: 'What is an economy fuel?' Is it distillate quality material with a *temporary price advantage*? Is it a product that does not meet present diesel fuel standards? Or should we look upon only *heavier, non-standard products* as economy fuel?

"Certainly no one has come up with a universally accepted definition of economy fuels. Perhaps it is time we looked beyond the per-gallon cost of the fuel by itself and reset our sights to a more inclusive definition. This might translate economy fuel as the diesel fuel available which will give satisfactory performance at a lower overall operating cost.

"Under this definition, for one railroad the A, B and C fuels would

be the cheapest and most economical. Another railroad might have economy fuels available on its right-of-way. If they were available in adequate quantities, the railroad might be able to afford the additional cost of equipment, storage and maintenance to switch to the lower-cost fuels. The buyer would have to have some assurance of continued supply and consistent quality, and pay for the [equipment] needed to handle the economy fuel.

Cooperation Needed

"Even though we had five years of experience with this heavier distillate in our own equipment, we had to work very closely with our customers to evaluate the fuel in railroad service. It will require the same kind of cooperative effort to evaluate residual fuels and residual blends in diesel locomotives.

"Existing railroad engines were not designed to burn heavy residual fuels. Special equipment will have to be added to the engine to use residual and residual blends. Separate fuel storage tanks will be required on the engine and in the yard. In order to handle the heavier fuel, you may have to provide heat for the residual fuel in storage tanks. The oil industry has stored, handled and transported these heavy fuels for years. We can help you with your storage and handling problems.

"We are proud of the contributions we have made in the transition from virgin gas oils to B and C fuels and heavier distillates in diesel engine operation. Just as we have worked with our customers in developing satisfactory heavier distillate for railroad service, we are ready to help evaluate the use of residual fuels. We can help you establish the availability of residual fuels in your area.

"Every railroad's problem is usually an individual one. The answer to your fuel problems has to be tailor-made to the requirements of the equipment you operate and fitted to your sources of supply. You will have to find the solution to your fuel problems in your own backyard."

How Are Railroads Doing . . . in the

A panel discussion of the carriers' needs for technically trained men, the difficulties being encountered in meeting these needs, and the methods that are producing the best results

THE QUESTION:

How can the railroads attract and hold an adequate number of qualified engineering graduates in competition with other industries?

Railroads will have to do a better job of "selling" themselves if they expect to get their share of engineering graduates from colleges and universities. And they will have to make railroad employment more attractive if they expect to keep the young engineers that start with them.

These opinions were expressed during a panel discussion at Chicago March 14 at the annual convention of the American Railway Engineering Association. Here is what the panelists had to say:

Is the Need Being Satisfied?

GROVE: Mr. Echols, as a railroad member of this panel, do you feel there will be a continuing need for graduate engineers on the railroads? And give your reasons.

ECHOLS: I feel that is one of the most vital things that the railroad industry has facing it today, that is, the acquisition of proper engineering talent among the young folks coming out of school at the present time. I think that the vitality of the industry, 20 years from now, will be directly proportional to the number of these gentlemen we can attract from the various campuses.

GROVE: Are you able to recruit each year the number and type of engineering graduates you desire?

ECHOLS: Not as many; no, sir. We probably don't get over 60 to 75 per cent of the number we would like to have.

GROVE: Mr. Tilman, do you have any comments to make on these questions I have asked?

TILMAN: Our need is there. We must have men for replacements due to deaths and retirements. We must have men to replace our losses due to the keen competition from other industries, and from public works agencies.

As far as this year goes, we are in pretty good shape as to our engineering needs and our regular employment. Civil engineers for construction, maintenance and surveying are generally available, more so than

they have been in previous years, but in our training program where we need civil, electrical, mechanical and industrial engineers, the going isn't so good.

GROVE: Dean Eshbach, there is concern about the shortage in engineering graduates generally. Does this shortage apply to engineers who are seeking employment with the railroads, also?

ESHBACH: Yes, the shortage will be alleviated slightly by a gradual growth in the next few years, but in the field of civil engineering, it is a pretty sad picture.

I think everyone should realize that the percentage of students enrolling in civil engineering is dropping, while there is a slight increase in all registrations. For example, in the senior year there will be about 70 per cent civil engineers; in the junior year, 50; in the sophomore year, 13;

These are the men



C. G. GROVE (moderator)

Area engineer, Pennsylvania,
Chicago



G. H. ECHOLS

Chief engineer, Southern system, Washington,
D. C.

Scramble for Engineers?

and in the freshman year, about 11. This means you are going to have increasing difficulty the next few years in having a proper supply, particularly from this field.

Methods that Get Results

GROVE: Mr. Echols, to what do you attribute your success in recruiting engineers for railroad service?

ECHOLS: I said a while ago that we could get only 60 to 75 per cent, probably, of what we would like to have, so that is a little bit contradictory to that word "success." However, we endeavor to look at the qualifications of a man other than his engineering training or his school work. We think that a man who joins a student training program should be a man of heart. He is the man from whom we will choose our officers in the future. That man should have the desire to work practically day and night. You know, that's what you and I did, to start with. We try to choose that kind of person, one who has the interests of the railroad at heart, and who really wants to make railroading his life work.

When you get a fellow like that, you very seldom lose him. He stays

with you, and he can outperform or outthink two of any other type.

GROVE: Mr. Tilman, what has been your experience, in answer to my question?

TILMAN: Our success is partly due to the fact that we use men with engineering background and experience to do the recruiting. In this way the prospective candidates can be clearly told what we do and how we do it. I think that is important, that the man should know just what he has to look forward to.

GROVE: Dean Davis, how do the railroads measure up with other industries in their recruiting methods? Can you give us a comparison, and tell us how the railroads can help themselves? Are the railroads aggressive enough?

DAVIS: The recruitment methods of the railroads do not differ materially from those of other industries. The individual railroads do not seek as many graduates as some of the larger manufacturing companies, and so their recruitment programs are sometimes not as highly organized.

Your success will depend on the type of representative you send out.

He should have an attractive personality, should have a natural liking for youth, and should speak with authority on matters pertaining to railroading.

What Other Industries Offer

GROVE: Dean Eshbach, is industry offering inducements to engineers that are more promising than those presented by the railroad picture? What must we do to match or beat their offers?

ESHBACH: From a salary standpoint, I think I'd say you're about comparable. The offerings today are somewhere between four and five thousand dollars a year.

There is another development which is going to increase your difficulties in the next couple of years, and you should be aware of it. In the past ten years in this country, expenditures in development and research in industry have gone from a billion to about five billion dollars a year, and the shortage that everyone is going to experience in the availability of engineers is going to be due in large measure to the demands which this activity is making for the best men who are graduating

who made up the panel . . .



O. W. ESHBACH

Dean, Technological Institute, Northwestern University



D. W. TILMAN

Senior assistant engineer, Baltimore & Ohio, Baltimore



R. P. DAVIS

Dean, College of Engineering, West Virginia University

from the colleges. It is creating an increasing demand for masters and doctors degrees.

Industries are offering financial subsidies for men to go on with these programs. They are following them from the time they are undergraduates, until they graduate.

This takes away the very best talent from the already short supply. That is a good thing from the standpoint of the country, but you have to face this competition, and this is something that I think is going to be tremendously difficult. I believe if you capitalize on the idea—and sell it to students and to the public—that the railroads are and always have been a very vital part of our economy, and that, managerially and in engineering work, they will always have challenging opportunities for young men, I think you can lessen the competition, to your betterment, with good, hard work.

Better Selling Job Needed

GROVE: Mr. Echols, in view of what has been said, what do you think the railroads should do to improve their recruiting position?

ECHOLS: I think that we, as engineers, are notoriously bad salesmen. You know that when you do get an engineer who is a good salesman, he's pretty soon on the top floor of his building; he's running the "shebang". But, generally speaking, we engineers are very poor salesmen.

On the other hand, the other industries that are competing with us for the services of these people have very good salesmen. For instance, in the aeronautics industry and the automobile industry, they sell them on the glamour of the profession, of their work. Forty or fifty years ago, the railroads had that glamour for the youngsters; now it's the electronics boys. What we have to do is to be sure that we, as an industry, tell these youngsters that the future for young men in the railroad industry of America is greater than it ever has been before with this mechanization that we have facing us.

We have just scratched the surface so far as the mechanization in yards, main line movements, maintenance of way, and what have you, are concerned. We should sell them on the

idea that "that's gold in them thar hills." All they have to do is to get in and scratch with the railroads, and there's plenty for them to do and plenty of good future ahead of them.

I think we can out-glamour the glamour boys by telling them about the pushbutton yards we have, for instance. They don't know that we use electronics; a lot of folks don't. Some of these youngsters think that the latest thing that the railroads have done is the installation of a slot in the Pullman car where you can drop used safety razor blades. We're responsible for that. We should tell the world what we've got and what we intend to do.

Need for Training Programs

GROVE: Dean Davis, do you think that the training programs in effect on some railroads, similar to programs under way by industry, are worth while or essential for young engineers desiring to work for the railroad?

DAVIS: I believe training programs are worth while. Graduation from college means that a boy has had four years or more of systematically organized study, and we need a gradual transition from this type of learning to the one in which the individual is on his own.

GROVE: There has been considerable comment in the educational field and among the students, particularly, concerning the training programs that are in effect on some of the railroads. This question we are discussing is one that does not apply with equal emphasis to all railroads, for many of the railroads have used

a training program, and effectively. However, there is a question in the minds of the students as to whether they want to spend additional time—an additional two or three years—easing into their jobs on the railroad. Generally speaking, where the training program is effectively set up and carried out, it has many advantages during that transition period.

Mr. Tilman, do you experience difficulty in holding graduate engineers after they have entered the service? If so, what are the predominating causes for leaving, and what can be done to remedy the situation?

TILMAN: We have considerable difficulty in holding our engineers. In my opinion, this is because of the slow promotion, and the inadequacy of the present salaries in the middle brackets. It is also due to the absence of sliding salary scales.

A formal program of promotion, based on merit, would help. Unnecessary and frequent moving around of the men is objectionable in some cases, particularly amongst the married men, but aside from all these features, other industries can usually induce our young men to come to them with the lure of high salaries.

GROVE: We have presented this subject in a general way and we feel that people in the audience would like to ask questions.

Reaching High School Graduates

QUESTION: All of this discussion has been about competition for grad-

Act now to fill summer jobs!

Railroads desiring to obtain undergraduate engineers for temporary work this summer should make their needs known right away. This warning comes from AREA Committee 24—Co-operative Relations with Universities—following a meeting held at Spring-

field, Mo., on April 6. Representatives on the committee from colleges and universities reported an unusual demand this year for undergraduates for summer jobs. Railroads with such positions to fill are urged to contact college placement bureaus without delay.

uate and student engineers in our colleges. You plan to distribute a brochure* to high school counselors, if requested. Does the committee recognize the fact that the shortage of engineers is due to the fact that young men don't go to college to be engineers? Do you think that one copy of a brochure, upon request, is adequate to interest high school students in becoming engineers? That's quite a question in our local high school today.

GROVE: At the time of the publication of our brochure for students, we had in mind publishing two, one for undergraduates in colleges and universities, and one for use in high schools. Due to many reasons—among which was the question of finances—it was concluded that we would first publish this brochure primarily for the undergraduates in colleges and universities, but that we

*A 28-page illustrated booklet published by the AREA telling of the opportunities in the railroad field for young engineers.

would have some distribution in the high schools.

It is my opinion, based on my own experience, that an individual who is going to seek an engineering degree, or is going to college and isn't certain as to just what he is going to do, is much influenced by information which might be available to him in his senior year in high school.

HOWARD (Mr. N. D. Howard, executive secretary of AREA): I don't know that the committee has given up entirely the idea of ultimately producing a second brochure better adapted to high school students. To date we have received requests from about 150 high school counselors. That is much smaller than we anticipated, because on previous occasions we received as many as 600 requests from high school counselors for certain publications dealing with this subject.

GROVE: In summing up the situation as it appears to me today, the railroads are not at present an ex-

panding organization such as the industries with which we compete for young men in colleges and universities, but there are opportunities for young men in engineering and managerial capacities on the railroads now, and there always will be such opportunities. If we can get the young men who are interested and willing to accept the challenge that railroading offers to them, we will be able to secure and retain them in our service.

This problem is unique in that it doesn't apply with equal intensity to all railroads. Some of us are able to secure as many graduates as we want.

The reply to our panel question can be stated in two ways. First, we must have an adequate starting salary that will enable us to compete with other industries in getting these young men to come with us, and, second, if we can show them by the experience of others that they will have a chance to advance to positions of responsibility equalling those in other industries, we will have no trouble in keeping them.

(Continued from page 16)

on 45 counts of safety-act violations; and, in February, 19 roads paid \$9,200 and costs on 92 counts of like violations. The fines were imposed in various federal district courts on the basis of information furnished by the commission.

The 1955 fines for safety-act violations ranged from the \$7,800 and costs paid by the Pennsylvania after confessing to 78 counts, to \$100 and costs paid by each of 13 roads which confessed to one count. Fourteen roads, in addition to the PRR, paid 1955 safety-act fines of \$1,000 or more and costs. Their payments ranged from \$1,000 and costs for the Soo Line, which confessed to 10 counts, to \$4,500 and costs for the New York Central, which confessed to 45 counts.

The safety-act fines imposed during this year's first two months ranged upward from \$100 and costs and included payments of \$1,000 and costs, or more, by each of five roads. The latter included the NYC, Rock Island and Chicago River & Indiana, each of which confessed to 16 counts and paid \$1,600 and costs. The two others in the \$1,000-and-over group were the Missouri Pacific,

which paid \$1,000 after confessing to 10 counts, and the Texas & Pacific, which confessed to 13 counts and paid \$1,300.

No fines for hours-of-service violations were reported for this year's first two months. The \$3,900 and

costs paid for such violations in 1955 included payments ranging from \$100 and costs, paid by each of three roads which confessed to one violation, to \$1,100, paid by the Southern Pacific, which confessed to 11 violations.

New GE Locomotives for Use Anywhere

A universal line of nine diesel-electric locomotives that can be used on almost any railroad in the world will be built by the General Electric Company.

There are still over 100,000 steam locomotives operating in countries outside the U.S., and the new line is designed to meet the current overseas motive power revolution by standardizing diesel-electric locomotives.

Any of the nine diesel-electrics can be used for switching, freight, or passenger service and can be built for a wide variety of gages. All are proportioned to meet the restricted clearances encountered abroad and can be adapted to all types of couplings and braking systems.

Five Sizes—The nine locomotives

include five horsepower sizes: 400, 600, 990, 1,320 and 1,980. They produce a range of maximum speeds from 60 to 92 mph, and continuous tractive forces from 26,500 lb to 53,000 lb.

The 990-, 1,320-, and 1,980-hp locomotives can be built with two-axle trucks, or, when lighter axle-loading is required because of track and roadbed conditions, with three-axle trucks. The 400- and 600-hp locomotives will both use the same chassis, and the 990- and 1,320-hp units will be built on the same chassis.

G-E engineers expect a floating bolster suspension system, used throughout the universal line, to reduce maintenance costs because it should reduce vibration. This suspension system employs a truck bol-

are man-hours slipping through
your fingers?



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Atchison, Topeka & Santa Fe Railway,
since 1930, 168 lines
Atlantic Coast Line Railroad Co.,
since 1926, 900 lines
Chicago, Northwestern Railway Co.,
since 1915, 94 lines
Chicago, Rock Island & Pacific RR.,
since 1929, 280 lines
Cleveland, Cincinnati, Chicago & St. Louis Ry.,
since 1930, 30 lines
Delaware, Lackawanna & Western RR.,
since 1930, 37 lines
Illinois Central Railroad Co.,
since 1923, 1550 lines
Kansas City Southern Railway,
since 1923, 50 lines
Louisville & Nashville RR.,
since 1914, 975 lines
Missouri Pacific Railroad,
since 1923, 262 lines
New York Central System,
since 1913, 345 lines
Norfolk & Western Railway Co.,
since 1927, 140 lines
Pennsylvania Railroad,
since 1938, 50 lines
Southern Pacific Lines,
since 1934, 45 lines
Union Pacific Railroad Company,
since 1922, 100 lines

When your people have to walk about to exchange information, they're wasting time—through no fault of their own! What you need is a P-A-X Business Telephone System, providing "touch-of-a-dial" communication to the office next door—or 'way in the next division!

Through the P-A-X System, each person can reach anyone else—in seconds. Overall supervision is made easier, and all departments can coordinate their activities for top efficiency. That's why many railroads depend on P-A-X for lightning-fast communication throughout the length and breadth of their widespread operations.

Rent-free P-A-X is railroad-owned and controlled; your own communications men install and move P-A-X telephones as you wish. It is rent-free, entirely separate from the public telephone system, and uses railroad-owned or leased lines.










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OUTLINE									
MODEL	U4B*	U6B*	U9B	U9C*	U12B	U12C*	U18B	UD18B	U18C*
Diesel engine, gross horsepower	400	600	990	990	1320	1320	1980	1980	1980
Wheel arrangement	B-B	B-B	B-B	C-C	B-B	C-C	B-B	B-B	C-C
Total weight, fully loaded	104,000 lb.	108,000 lb.	150,000 lb.	173,000 lb.	157,000 lb.	179,000 lb.	211,000 lb.	240,000 lb.	206,000 lb.
Weight per axle, fully loaded	26,000 lb.	27,000 lb.	37,500 lb.	28,833 lb.	39,250 lb.	29,667 lb.	52,750 lb.	60,000 lb.	34,333 lb.
Locomotive speed at maximum motor rpm	60 mph	60 mph	86 mph	86 mph	86 mph	86 mph	92 mph	92 mph	86 mph
Diesel engine	D375	D397	FW-6	FW-6	FV-8	FV-8	FV-12	FV-12	FV-12
Traction generator	GT-595	GT-595	GT-577	GT-577	GT-581	GT-581	GT-581	GT-581	GT-581
Traction motors	GE-761	GE-761	GE-761	GE-761	GE-761	GE-761	GE-752	GE-752	GE-761
G-E specification no.	4666	4667	2076	2078	2077	2079	2080	4487B	2081

*Models available for 36-inch gage applications, using GE-764 traction motors.

EACH OF THE G-E universal locomotives has a coded model number which indicates its horsepower classi-

fication and the number of axles. Thus, U4B denotes a universal locomotive of 400 hp with four axles.

ster mounted on rubber pads to permit lateral motion of the truck. Fully equalized and floating on rubber, the locomotive will receive less jar and

strain. Also, minimum stress will be placed on tracks and structures.

Truck maintenance cost should be reduced and maintenance procedure

simplified, by elimination of the many complicated, and often inaccessible, support members of the conventional lateral-motion truck.

Financial

Dividends Declared

CLEVELAND & PITTSBURGH.—4% guaranteed, 50¢, quarterly; 7% guaranteed, 87½¢, quarterly; both payable June 1 to holders of record May 10.

ERIE & PITTSBURGH.—7% guaranteed, 87½¢, quarterly, payable June 11 to holders of record May 31.

LAKE SUPERIOR & ISHPEMING.—35¢, quarterly, payable April 16 to holders of record April 2.

LOUISVILLE & NASHVILLE.—\$1.25, quarterly, payable June 12 to holders of record May 1.

MISSOURI PACIFIC.—Class A, \$2, payable May 15 to holders of record April 23 (first dividend declared since reorganization).

NORTHERN (New Hampshire).—\$1.50, quarterly, payable April 30 to holders of record April 12.

ONTARIO & QUEBEC.—\$3, semiannual, payable June 1 to holders of record May 1.

PHILADELPHIA, GERMANTOWN & NORRISTOWN.—\$1.50, quarterly, payable June 4 to holders of record May 18.

PIEDMONT & NORTHERN.—\$1.25, quarterly, payable April 20 to holders of record April 5.

PITTSBURGH, YOUNGSTOWN & ASHTABULA.—7% preferred, \$1.75, quarterly, payable June 1 to holders of record May 18.

WEST JERSEY & SEASHORE.—6% special guaranteed, \$1.50, semiannual, payable June 1 to holders of record May 15.

WESTERN PACIFIC.—75¢, quarterly, payable May 15 to holders of record May 1.

Supply Trade

J. J. Hennessy, Jr., has succeeded his father, **J. J. Hennessy, Sr.,** as president of **Hennessy Lubricator Company.**

C. W. Floyd Coffin, executive vice-president of **Franklin Railway**

Supply Company, has been elected chairman of the board, succeeding **Samuel G. Allen.**

OBITUARY

Russel C. Mahon, founder and chairman of the board of **R. C. Mahon Company,** died at his home in Detroit, March 30.

Organizations

Association of American Railroads.—Spring meetings have been announced as follows: Texas Regional Committee, Protective Section, Southern Pacific Depot Building, Houston, April 25; Chicago Regional Committee, Protective Section, Congress Hotel, Chicago, April 25; Denver Regional Committee, Protective Section, Footprinter's Club, Denver, April 26; Memphis-New Orleans Regional Committee, Protective Section, King Cotton Hotel, Memphis, Tenn., May 10; Seattle-Spokane Regional Committee, Protective Section, Georgia Hotel, Vancouver, B. C., Canada, May 3; Atlanta-Jacksonville Regional Committee, Protective Section, Mayflower Hotel, Jacksonville, Fla., April 26; Pittsburgh Regional Committee, Protective Section, Allegheny Elks Lodge No. 339, Pittsburgh, April 19; Richmond-Norfolk Regional Committee, Protective Section, Hotel Roanoke, Roanoke, Va., April 25.

New York Railroad Club.—**David I. Mackie,** chairman Eastern

Railroad Presidents Conference, will speak on "Eastern Railroads at the Grass Roots," at a dinner meeting in the Hotel Commodore, April 19.

Pacific Railway Club.—The Southern Pacific pipe lines will be the topic at a dinner meeting to be held April 19, in the Elks' Temple, Los Angeles, the speakers being **Frank E. Kalbaugh,** general manager, and **Byron K. Smith,** assistant general manager, Southern Pacific Pipe Lines, Inc. New officers of the club are: President, **G. S. Allen,** superintendent transportation, Western Pacific; vice-presidents, **D. K. Miller,** assistant superintendent, Southern Pacific; **R. E. Marks,** assistant to vice-president, SP; **Frank H. Smith,** division freight agent, Santa Fe; and **Paul G. Beach,** advertising manager, Union Pacific; treasurer, **W. J. McHugh,** assistant superintendent motive power, SP.

Railway Officers

FLORIDA EAST COAST.—**P. L. Gaddis,** superintendent of the system, retired April 1 and has been succeeded by **I. E. Hamilton,** assistant superintendent.

GREAT NORTHERN.—**John J. Maloney** has been appointed assistant superintendent of communications at Spokane, Wash., succeeding **E. L. Gilleland,** deceased.

GULF, MOBILE & OHIO.—**Donald J. Wheeler** has been ap-

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RAILS**

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City, State _____

pointed freight traffic agent at Minneapolis.

MISSOURI PACIFIC.—A. G. Thaman, general freight agent at St. Louis, retired February 29.

W. J. Boever has been appointed freight traffic manager—rates and divisions at St. Louis.

NEW YORK, ONTARIO & WESTERN.—Robert T. Peterson, general agent at Kansas City, Mo., has been transferred to Portland, Ore., in charge of an office established April 1 at 337 Pittcock Block.

NORFOLK & WESTERN.—William H. Jackson, superintendent of the Radford division, at Roanoke, has been appointed general agent and superintendent of the Norfolk terminal, succeeding the late J. W. Kirk. C. H. Hale, Roanoke terminals superintendent, has become Radford division superintendent, and his position has been taken by W. O. Tracy, Jr., assistant superintendent, Norfolk terminal. Richard F. Dunlap, Scioto division trainmaster, Portsmouth, Ohio, has been appointed assistant superintendent at Norfolk, and has been succeeded by W. C. Stevens, assistant trainmaster at Kenova, W. Va.

NORTHERN PACIFIC.—J. A. Cannon, superintendent of motive power at Seattle, has been appointed general mechanical superintendent at St. Paul, succeeding G. L. Ernststrom, retired. F. W. Taylor, has been transferred from St. Paul to succeed Mr. Cannon, and in turn has been replaced by O. J. Murphy, master mechanic at St. Paul. Mr. Murphy's successor is C. H. Moreau, transferred from Jamestown, N. D., and who in turn has been succeeded by C. J. Wirth, assistant master mechanic at Seattle.

READING.—J. Howard Miller, Jr., assistant to vice-president, traffic, has been named to the newly created position of manager, trailer-on-flat-car service.

SEABOARD.—E. P. Bledsoe, assistant shop superintendent at Jacksonville, Fla., has been appointed acting shop superintendent there. S. D. Dekle, master mechanic at Jacksonville, has retired.

C. H. Campbell, system diesel supervisor, at Hamlet, N. C., has retired.

SOO LINE.—J. H. Tone has been appointed assistant superintendent, communications at Minneapolis.

SOUTHERN PACIFIC.—Theodore S. Bean, assistant general superintendent maintenance of way shops and equipment at San Francisco, has been appointed general superintendent maintenance of way shops and equipment there, replacing Roy B. Chapman, who retired March 31.



NEW YORK CENTRAL.—Harold C. Saakvitne (above), commerce attorney, has been named executive assistant—staff

Mr. Bean's successor is Vincent R. Erquiaga, general supervisor automotive equipment at San Francisco, who in turn has been succeeded by Robert J. Gill. Roy W. Putnam, engineer maintenance of way and structures at San Francisco, retired March 31.

WABASH.—John L. Davidson, Jr., first assistant attorney general of Illinois, has been appointed general counsel of the Wabash at St. Louis, effective April 16.

Emil J. Rohlfling, division passenger agent at Chicago, has been appointed manager, rates and divisions at St. Louis, succeeding Walter G. Kuhlman, assistant general passenger agent, who retired April 1. Glenn F. Welker who was transferred from Kansas City, Mo., to replace Mr. Rohlfling, has been succeeded by Milton E. Hohnbaum, district passenger agent at Dallas, Tex. Robert M. Pierson, passenger agent at Chicago, replaces Mr. Hohnbaum. John P. Turner, district passenger agent at Houston, Tex., has been named division passenger agent at Detroit, replacing H. F. Bobbitt, deceased. Mr. Turner's successor is Don J. Peterson, division passenger agent at Decatur, Ill., who has been succeeded by Clarence J. Luker. Elmer V. Cannon has become manager, mail, baggage and express traffic at St. Louis.

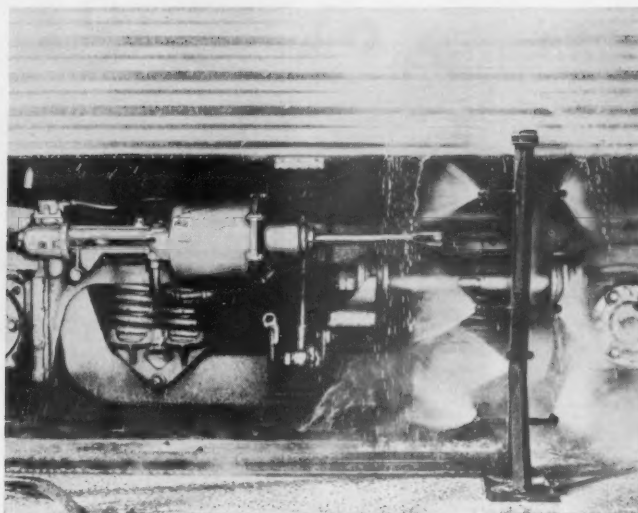
OBITUARY

John P. Mullen, general agent of the Wabash at Minneapolis, died April 6.

O. H. Newman, assistant to the vice-president — personnel of the Union Pacific, died March 19 at Portland, Ore.

James E. Weller, 87, retired traffic manager of the Pennsylvania, died April 4 at Chicago.

Oakite gives you the IMPORTANT advantage ... **LOW-COST END RESULTS**



FOR EXAMPLE: *one railroad
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There's only one *real* way to compare costs of cleaning materials ... and that's by the *results* you get from those materials.

Such a comparison erased all doubts for one Class 1 road. Truck units are now rack-washed with Oakite Composition No. 8 and kerosene. At first glance there seems to be no cost-per-gallon advantage over old method. But look at the performance and subsequent savings!

	Cost per gal.	Cost per gal. spirits	Mixture Used	Cost per gal. Mixture	Gals. used per month	Cost per Month
Competitive Cleaner	95¢	10¢	1 part to 4 parts spirits	27¢	7200	\$1944.00
Oakite Cleaner	95¢	10¢	1 part to 7 parts spirits	20.6¢	7200	\$1483.20

RAILROAD SAVES \$460.80

Apart from economy, these figures also prove the *quality* and cleaning *efficiency* of the Oakite cleaner. It chases all grease and grime with a 1 to 7 dilution, or about *half* the concentration of the competitive cleaner.

This is still another success story demonstrating that with Oakite, you get the **IMPORTANT** advantage... **LOW COST END RESULTS**.

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Technical Service Representatives in Principal Cities of U. S. and Canada

RAILROAD DIVISION

REVENUES AND EXPENSES OF RAILWAYS

(Dollar figures are stated in thousands; i.e., with last three digits omitted)

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1956

Name of Road	Average in period	Operating Revenues		Total		Operating Expenses		Total	Operating ratio	Net		Net railway tax operating income
		1956	1955	1956	1955	1956	1955			from operation	from operation	
		Freight	Pass.	Freight	Pass.	Deprec.	Deprec.					
Akron, Canton & Youngstown.....	Feb.	171	4,000	850	8,450	71	850	8,571	72.3	830	862	852
2 mos.		3,124	37,257	82,834	41,061	40,638	46,187	5,251	73.1	264	264	93
Atlanta & St. Andrews Bay.....	Feb.	82	331	1	335	34	26	3	7.1	10,078	5,402	4,844
2 mos.		1,312	76,723	6,273	81,613	12,720	10,661	1,363	72.9	21,017	11,379	9,349
Atlanta & West Point.....	Feb.	93	241	23	326	327	41	47	46.1	368	139	147
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Baltimore & O'lo.....	Feb.	343	1,200	325	1,200	325	16	288	66.7	586	207	354
2 mos.		6,020	32,056	2,843	72,747	59,120	7,769	6,401	80.4	5,341	2,224	1,894
Staten Island Rapid Transit.....	Feb.	29	119	527	468	103	82	23	98.2	10	41	55
2 mos.		1,574	10,960	1,731	14,280	12,993	1,876	1,823	82.8	1,531	511	514
Bangor & Aroostook.....	Feb.	602	1,676	30	1,761	1,200	325	325	86.3	586	207	354
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Bessemer & Lake Erie.....	Feb.	208	1,307	592	1,307	592	16	288	66.7	586	207	354
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Boston & Maine.....	Feb.	1,574	10,960	1,731	14,280	12,993	1,876	1,823	82.8	1,531	511	514
2 mos.		1,574	10,960	1,731	14,280	12,993	1,876	1,823	82.8	1,531	511	514
Canadian Pacific Lines in Maine.....	Feb.	234	804	43	871	712	112	100	67.3	81.7	286	34
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Carolina & Northwestern.....	Feb.	284	610	170	3,592	3,378	568	525	58.3	256	49	106
2 mos.		1,764	6,362	348	7,245	6,981	1,121	1,036	80.2	79.9	710	240
Central of Georgia.....	Feb.	613	4,094	455	4,891	4,311	577	580	78.8	80.7	1,036	487
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Central of New Jersey.....	Feb.	397	1,591	145	1,845	1,697	217	221	81.7	204	47	36
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Chesapeake & Ohio.....	Feb.	5,132	29,764	514	31,743	25,335	3,527	3,120	78.6	9,949	4,683	5,671
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Chicago & Eastern Illinois.....	Feb.	868	2,539	201	2,946	2,736	310	348	77.5	19,582	9,440	11,138
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Chicago & Illinois Midland.....	Feb.	1,470	2,605	5	2,780	2,695	426	416	68.0	1,794	705	697
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Chicago & North Western.....	Feb.	7,836	23,113	1,356	14,401	14,077	2,357	2,129	91.8	414	1,170	310
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Chicago, Burlington & Quincy.....	Feb.	8,806	16,282	1,324	19,588	17,882	2,193	2,195	85.3	2,258	1,544	622
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Chicago Great Western.....	Feb.	1,470	2,605	5	2,780	2,695	426	416	68.0	1,794	705	697
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Chicago, Milw., St. Paul & Pacific.....	Feb.	10,641	32,165	2,489	38,461	36,405	5,702	5,231	85.3	2,258	1,544	622
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Chicago, Rock Island & Pacific.....	Feb.	7,597	12,054	1,295	14,636	14,010	1,817	1,659	81.2	2,322	1,967	1,390
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Chic., St. Paul, Minn., & Omaha.....	Feb.	1,616	2,203	127	2,526	2,445	341	338	78.4	891	994	1,195
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Clinchfield.....	Feb.	295	2,106	268	2,205	1,961	292	291	86.6	1,76	381	407
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Colorado & Southern.....	Feb.	718	1,976	57	1,165	1,074	146	159	81.1	1,881	394	1,447
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121
Ft. Worth & Denver.....	Feb.	1,362	1,396	127	1,687	1,669	257	257	84.3	220	264	108
2 mos.		1,312	6,020	65,686	1,341	35,465	29,195	3,728	77.6	252	135	121

REVENUES AND EXPENSES OF RAILWAYS

(Dollar figures are stated in thousands, i.e., with last three digits omitted)

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1956

Name of Road	Average mileage operated during period	Operating Revenues			Operating Expenses			Total	Trans-portion	Total	Operating		Net from railway operating	Railway New railway tax operating income	
		Pas.	Freight	Total (inc. misc.)	Total	Retire-ments	Deprec.				1956	1955		1956	1955
Colorado & Wyoming.....	40	198	198	396	396	35	35	129	197	185	61.3	61.3	124	69	47
Delaware & Hudson.....	40	421	421	842	842	3	3	251	379	360	56.5	56.5	291	163	84
Delaware, Lackawanna & Western.....	702	8,688	321	9,009	9,009	100	100	1,350	6,232	6,042	72.2	72.2	3,039	1,681	629
Delaware, Lackawanna & Western.....	962	5,629	759	6,388	6,388	135	135	1,083	5,821	5,621	82.6	82.6	1,213	448	436
Denver & Rio Grande Western.....	2,155	5,706	214	5,920	5,920	94	94	2,136	11,798	10,466	83.5	81.8	2,335	890	918
Detroit & Toledo Shore Line.....	2,155	11,323	445	11,768	11,768	188	188	1,873	7,927	7,124	62.6	62.6	4,228	2,254	2,249
Detroit, Toledo & Ironton.....	50	1,531	1,531	3,062	3,062	3	3	144	847	756	51.4	50.2	800	265	217
Duluth, Missabe & Iron Range.....	570	360	1	361	361	63	63	716	1,879	1,427	45.9	45.9	1,464	106	187
Duluth, South Shore & Atlantic.....	553	606	4	610	610	10	10	129	2,232	2,202	81.9	78.7	115	31	68
Duluth, Winnipeg & Pacific.....	175	671	1	672	672	4	4	78	429	374	63.3	69.4	249	47	40
Elgin, Joliet & Eastern.....	296	7,411	1,397	8,808	8,808	105	105	1,433	3,093	2,253	67.5	64.0	1,433	583	355
Erie.....	2,225	12,053	515	12,568	12,568	223	223	1,980	10,629	9,423	78.9	79.5	2,646	1,025	990
Florida East Coast.....	571	2,503	692	3,195	3,195	42	42	609	5,528	4,804	80.0	80.0	5,370	1,929	1,996
Georgia Railroad.....	321	638	6	644	644	9	9	133	1,243	1,243	73.4	68.7	935	212	451
Georgia & Florida.....	332	301	1	302	302	31	31	62	2,491	2,258	74.7	69.2	1,772	430	797
Grand Trunk Western.....	951	9,305	444	9,749	9,749	187	187	1,549	8,733	7,570	83.0	79.9	1,787	730	508
Great Northern.....	8,285	16,136	702	16,838	16,838	228	228	4,045	13,517	13,586	84.8	80.2	2,775	1,608	863
Green Bay & Western.....	224	721	1	722	722	4	4	60	1,273	1,273	73.5	73.5	1,273	1,273	1,273
Gulf, Mobile & Ohio.....	2,757	5,699	299	5,998	5,998	97	97	1,144	4,845	4,585	75.3	75.3	1,594	674	545
Illinois Central.....	6,531	19,754	1,812	21,566	21,566	485	485	4,122	18,066	16,657	76.1	74.8	5,686	2,957	2,095
Illinois Terminal.....	6,531	39,159	3,704	42,863	42,863	820	820	8,204	36,732	33,685	77.6	75.8	10,592	5,551	4,145
Kansas City Southern.....	355	1,243	67	1,310	1,310	43	43	419	1,688	1,474	81.9	84.9	373	135	82
Kansas, Oklahoma & Gulf.....	327	439	1	440	440	7	7	29	254	222	57.8	58.7	186	39	112
Lake Superior & Ishpeming.....	149	312	1	313	313	34	34	93	369	312	72.6	72.6	312	31	156
Louisiana & Arkansas.....	96	519	1	520	520	5	5	65	384	348	74.0	67.4	135	49	22
Louisiana & Arkansas.....	351	1,078	3,550	4,628	4,628	117	117	1,057	4,586	3,998	94.4	89.1	272	332	362
Louisiana & Arkansas.....	753	2,117	53	2,170	2,170	19	19	281	1,319	1,165	58.3	54.9	1,944	408	461
Louisiana & Arkansas.....	753	4,279	106	4,385	4,385	59	59	560	2,660	2,379	58.0	54.9	1,923	813	899

PUT YOURSELF IN THIS PICTURE AND ASK—



"... just what can we do to prevent damage here?"

"That's easy—switch to the National MF-400 Rubber-Cushioned Draft Gear. It fits both standard pocket and yoke."

"Yes, I know that. But what does it have to offer over friction gears?"

"Well, first of all, tests prove that most coupling is performed at 7 to 8 mph—not at 4 to 5 mph. And at today's higher speeds, friction gears simply don't have it..."

"In what respects?"

"I don't want to sound too technical but here's why. The impact quantum is the amount of work that must be done in any impact. Purpose of the rubber cushioning is to permit this work to be done with a minimum of force transmitted to the car. This reduction in force

is performed by the *extra-long travel* and *high cushioning capacity* of National Rubber Draft Gears."

"Longer travel makes lots of sense to me. Do you have any test figures on capacity of your National Rubber Draft Gear?"

"We certainly do. We measure and record forces on modern *electronic* instrumentation installed in cars on test tracks at our new Technical Center. That gives National *duplicated*—not laboratory simulated—operating conditions..."

"Now you're talking. Let's go into my office and go over actual figures..."

National Rubber-Cushioned Draft Gears give you protection when you need it—at high impact speeds!

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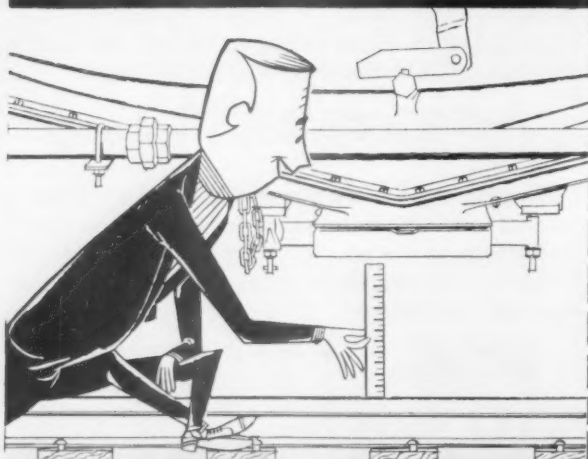
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the job of two standard coats!**

Now you can cut material and out-of-service costs by eliminating time for drying and application of a second coat. One full coat of Kem Kold Bild does it using conventional spray equipment. Kem Kold Bild dries in 1½ hours, is ready for stenciling in 2 to 3 hours. You get good film flow with a minimum of overspray. And a dry-film thickness as heavy as 2½ mils.

This cold-spray synthetic enamel produces a bright gloss of exceptional durability, too. Withstands re-

peated cleanings and toughest service. Kem Kold Bild doesn't lift or affect primers. There's no pin-holing or bubbling from entrapped solvents during or after application.

Kem Kold Bild is being used by leading railroads and car builders now. Why not arrange for a demonstration by contacting The Sherwin-Williams Co., Transportation Division, Cleveland 1, Ohio.

[†]Trade-Mark

SHERWIN-WILLIAMS RAILWAY FINISHES



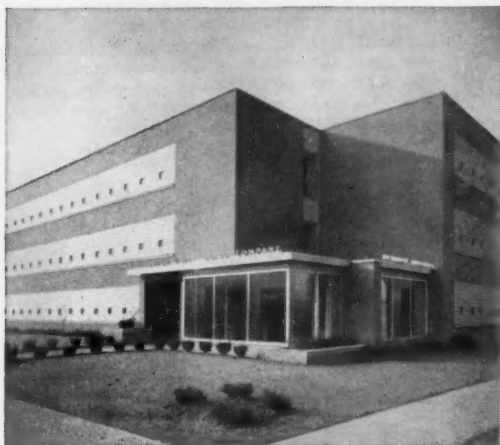
REVENUES AND EXPENSES OF RAILWAYS

(Dollar figures are stated in thousands; i.e., with last three digits omitted)

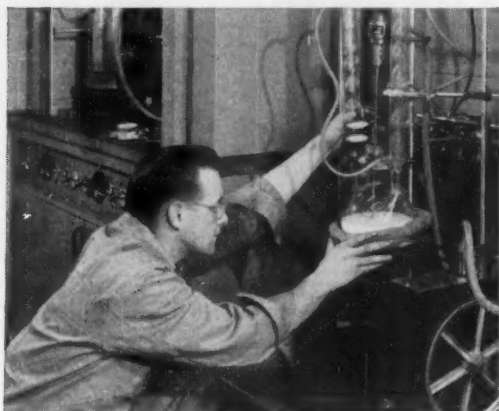
MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1956

Name of Road	Average mileage operated during period	Operating Revenues				Operating Expenses				Net from railway operation	Net Railway operating income								
		1956 (inc. 1955)				1955													
		Freight	Pass.	Other	Total	Freight	Pass.	Other	Total										
Richmond, Fredericksburg & Potomac Feb. 2 mos.	118	1,517	488	2,294	227	294	24	305	355	67	23	767	1,468	1,550	614	827	433	279	134
Rutland Feb. 2 mos.	391	3,381	1,061	4,654	4,363	604	48	634	669	61	13	26	152	337	3,330	80.1	70.9	1,650	359
Sacramento Northern Feb. 2 mos.	347	1,571	854	750	171	170	18	102	109	27	53	313	694	670	313	89.3	89.3	160	54
St. Louis-San Francisco Feb. 2 mos.	4,610	8,336	355	9,393	9,038	1,507	170	1,624	1,525	544	386	3,677	7,776	7,025	82.8	77.6	1,617	819	996
St. Louis-San Francisco & Texas Feb. 2 mos.	1,155	3,356	4	3,85	402	52	39	4	31	35	1	26	1,569	15,807	11,682	83.1	80.2	3,213	1,540
St. Louis Southwestern Lines Feb. 2 mos.	1,561	5,458	16	5,648	4,873	671	618	66	624	567	110	185	1,716	3,382	2,953	59.4	60.6	2,295	762
Savannah & Atlanta Feb. 2 mos.	144	315	...	328	315	60	42	2	45	49	14	15	91	222	1,903	60.8	63.0	4,407	1,394
Seaboard Air Line Feb. 2 mos.	4,062	11,857	1,151	14,146	12,930	2,095	2,101	195	2,486	2,244	582	392	4,575	10,992	9,224	71.3	71.3	2,226	1,063
Southern Railway Feb. 2 mos.	6,289	19,710	1,431	22,374	20,881	2,908	2,605	255	4,015	3,412	815	432	7,191	15,603	13,586	69.7	67.7	6,771	2,938
Alabama Great Southern Feb. 2 mos.	326	1,322	44	1,495	1,383	229	207	33	296	270	60	37	1,138	2,913	2,733	75.4	73.1	368	159
Cinn., New Orleans & Texas Pacific Feb. 2 mos.	337	3,058	119	3,370	3,246	573	483	61	614	513	147	72	934	3,366	2,933	70.2	62.6	766	329
Georgia Southern & Florida Feb. 2 mos.	473	5,931	300	6,674	6,653	1,215	972	128	1,279	1,157	204	148	1,826	4,817	4,189	72.2	63.0	1,857	561
New Orleans & Northeastern Feb. 2 mos.	204	743	34	844	864	188	146	21	168	142	43	23	256	1,339	1,317	77.8	79.0	382	140
Southern Pacific Feb. 2 mos.	8,124	36,136	2,367	40,546	37,179	5,159	4,693	470	8,443	7,928	1,988	857	15,982	32,699	29,617	80.2	79.7	8,037	3,551
Texas & New Orleans Feb. 2 mos.	4,313	10,550	375	11,367	10,075	1,748	204	1,670	1,372	1,157	382	1,794	33,066	66,112	60,877	80.9	81.3	15,645	7,324
Spokane International Feb. 2 mos.	150	257	...	267	286	48	51	2	139	121	43	23	226	1,339	1,317	75.8	62.1	382	140
Spokane, Portland & Seattle Feb. 2 mos.	947	2,079	63	2,288	2,365	344	363	57	843	770	114	72	1,928	3,297	2,972	73.7	68.0	466	192
Tennessee Central Feb. 2 mos.	286	883	28	930	741	161	128	13	149	116	40	29	273	673	571	72.4	77.1	1,328	561
Texas & Pacific Feb. 2 mos.	1,831	5,882	286	6,701	6,319	1,052	988	93	950	907	253	197	2,299	4,835	4,193	72.2	70.7	1,866	848
Texas Mexican Feb. 2 mos.	161	229	...	253	222	47	46	5	29	25	10	10	1,175	3,297	2,972	73.7	71.2	1,334	561
Toledo, Peoria & Western Feb. 2 mos.	239	604	1	614	502	101	95	6	73	57	20	40	149	389	333	63.4	66.4	225	99
Union Pacific Feb. 2 mos.	9,805	33,275	2,019	37,836	35,255	5,035	4,693	462	7,878	7,365	1,688	1,035	13,558	29,546	27,363	78.1	77.6	8,290	2,261
Virginia Feb. 2 mos.	611	8,814	...	9,254	6,591	888	808	129	1,116	1,000	370	214	2,716	6,087	5,308	77.9	76.0	1,603	475
Wabash Feb. 2 mos.	2,393	7,957	387	9,119	8,692	1,011	1,014	255	2,283	2,463	746	686	8,071	14,541	13,393	78.2	76.6	4,056	1,627
Ann Arbor Feb. 2 mos.	294	747	...	754	638	68	72	7	136	127	26	30	337	588	555	77.9	84.3	166	83
Western Maryland Feb. 2 mos.	846	3,995	4	4,210	3,323	557	484	19	843	770	221	118	1,409	3,152	2,445	71.9	73.6	1,057	377
Western Pacific Feb. 2 mos.	1,193	3,746	129	3,967	3,653	724	646	78	1,452	1,218	395	414	2,829	6,498	5,872	81.2	81.7	2,817	1,063
Wisconsin Central Feb. 2 mos.	1,042	2,328	28	2,478	2,182	302	282	35	420	350	85	74	1,050	1,959	1,742	79.1	79.8	519	198
	1,042	4,661	56	4,965	4,474	619	545	74	807	710	170	156	2,135	3,950	3,522	79.6	79.6	1,014	324

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The N&W's Annual Report for 1955



Norfolk and Western's freight traffic in 1955 rebounded sharply from the level of the previous year because of the generally high economic activity coupled with a strong foreign demand for bituminous coal.

As a result of substantial capital expenditures since World War II and our policy of keeping road-way and equipment in excellent operating condition, we were able to handle a 25 per cent greater volume of freight traffic more efficiently, which resulted in a 47 per cent increase in net income. Receipts reached a new peak, while common stock earnings

were the largest since 1948 and close to the highest in the Company's history.

Merchandise traffic volume reached a record high. New fast freight train schedules were put into effect, and the first joint line "piggyback" service in the South was inaugurated.

Expenditures for improvements, totaling \$16.4 million, included the purchase of 550 freight cars and 8 Diesel locomotive units, construction of new freight car shops at Roanoke and modernization of yards at three important points, all financed without borrowing.

Prospects for 1956 appear favorable.

N & W BRIEFS

	1955	1954	1953	1952	1951
Earnings per share of Common Stock	\$6.70	\$4.52	\$4.83	\$5.05	\$5.31
Dividends declared per share —					
Adjustment Preferred Stock	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00
Common Stock	\$3.75	\$3.50	\$3.50	\$3.50	\$3.50
Taxes (millions)	\$44.3	\$27.5	\$37.1	\$39.6	\$49.4
Expenditures for Property and Equipment					
acquisitions and improvements (millions)	\$16.4	\$17.7	\$32.4	\$28.8	\$28.5
Debt Outstanding (millions)	\$35.8	\$35.8	\$35.8	\$35.8	\$41.9
Times Fixed Charges Earned	27.97	19.24	20.60	20.25	18.83
Number of Share Owners	32,372	31,818	31,022	29,500	26,551
Bituminous Coal Tonnage (million tons)	51.7	40.1	45.5	46.5	52.7
Other Tonnage (million tons)	18.7	16.2	18.2	17.7	19.0
Average Revenue per ton carried one mile (cents)	0.980	1.038	1.050	1.025	0.947
Gross ton miles per freight train hour	77,547	72,670	71,991	68,820	68,280
Miles of road operated	2,128	2,134	2,135	2,135	2,135

CONDENSED INCOME STATEMENT

	1955	1954	Increase or Decrease	Per Cent
REVENUES AND OTHER INCOME:				
Freight—Bituminous Coal	\$124,766,364	\$ 92,387,158	Inc. \$ 32,379,206	35
Other	70,738,346	65,640,612	Inc. 5,097,734	8
Passenger	3,706,167	4,049,316	Dec. 343,149	8
Mail, Express and Miscellaneous	9,680,286	7,982,653	Inc. 1,697,633	21
Total Railway Operating Revenues	208,891,163	170,059,739	Inc. 38,831,424	23
Rent Income—Equipment and Joint Facilities—Net	11,999,718	9,139,335	Inc. 2,860,383	31
Other Income—Net	2,221,037	1,646,380	Inc. 574,657	35
Total	223,111,918	180,845,454	Inc. 42,266,464	23
EXPENSES AND OTHER CHARGES:				
Way and Structures—Repairs and Maintenance	25,272,080	24,704,904	Inc. 567,176	2
Equipment—Repairs and Maintenance	41,778,644	35,891,876	Inc. 5,886,768	16
Transportation—Operations	60,309,071	53,682,136	Inc. 6,626,935	12
Other Expenses	11,359,891	11,351,500	Inc. 8,391	
Total Railway Operating Expenses	138,719,686	125,630,416	Inc. 13,089,270	10
Taxes—Federal Income	30,500,000	14,900,000	Inc. 15,600,000	105
All Other Taxes	13,829,953	12,592,170	Inc. 1,237,783	10
Total Taxes	\$44,329,953	27,492,170	Inc. * 16,837,783	61
Interest on Funded Debt	1,431,668	1,431,668		
Total	184,481,307	154,554,254	Inc. 29,927,053	19
NET INCOME	38,630,611	26,291,200	Inc. 12,339,411	47
DIVIDENDS ON ADJUSTMENT PREFERRED STOCK	909,608	887,108	Inc. 22,500	3
	*37,721,003	25,404,092	Inc. 12,316,911	48
SINKING AND OTHER RESERVE FUNDS—APPROPRIATIONS	420,876	450,876	Dec. 30,000	7
BALANCE	37,300,127	24,953,216	Inc. 12,346,911	49

*Equivalent to \$7.88 per share of Common Stock, compared with \$4.89 in 1954.

*Equivalent to \$6.70 per share of Common Stock, compared with \$4.52 in 1954.

Norfolk and Western Railway

Ads Work

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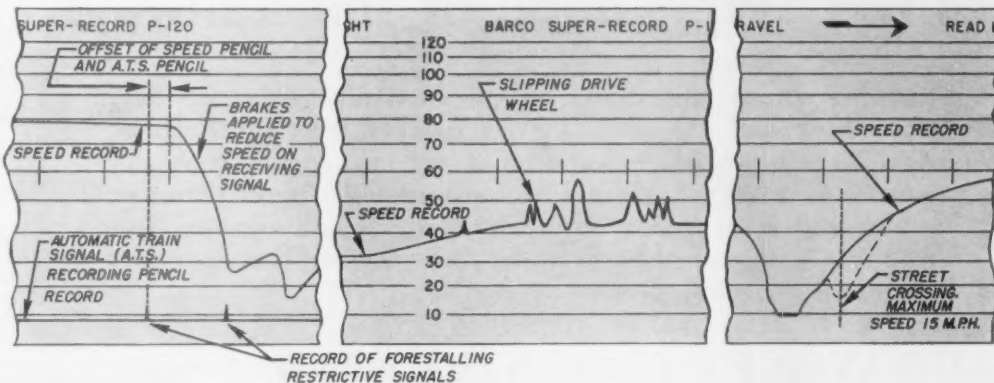
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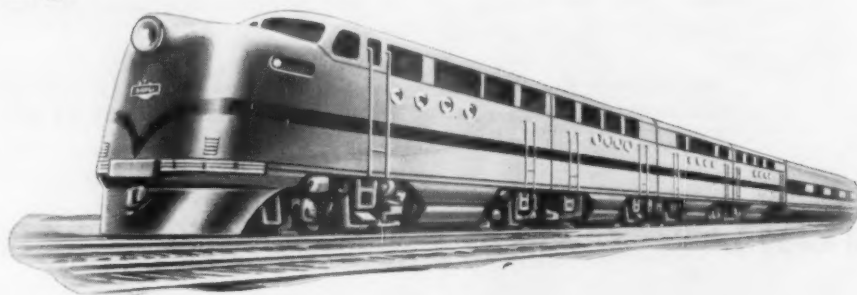
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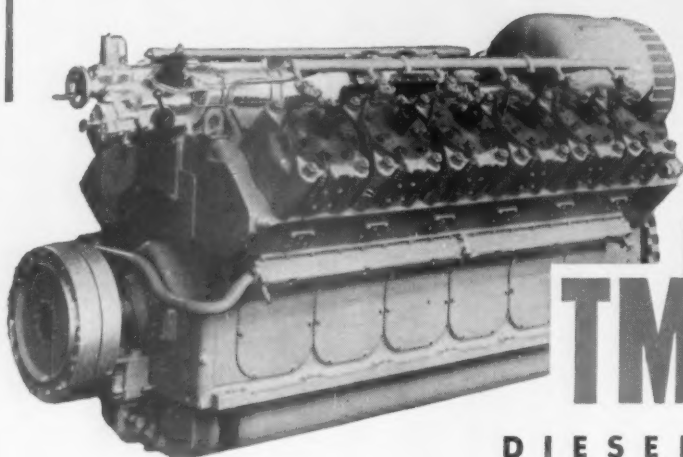
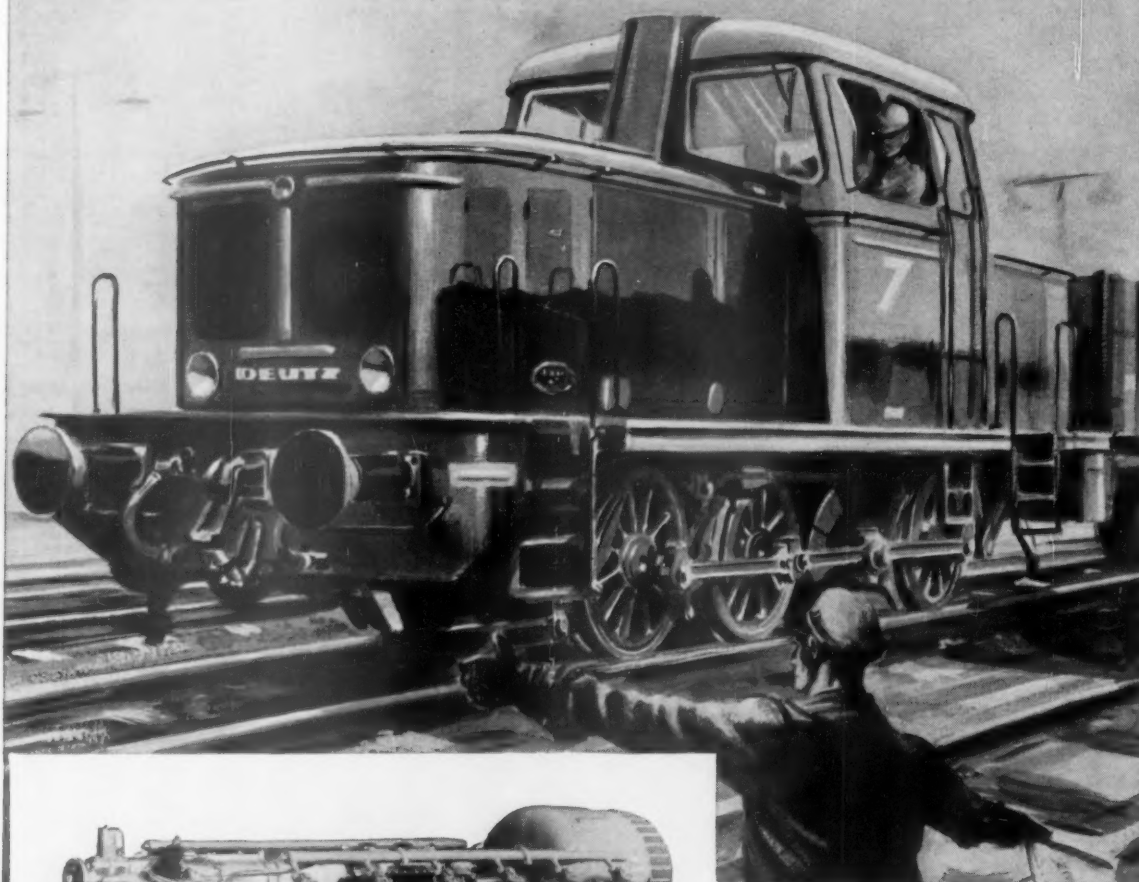
Freight Operating Statistics of Large Railways—Selected Items

		Locomotive Miles				Car Miles		Ton-miles (thousands)		Road-locomotion lines			
Region, Road and Year		Miles of road operated	Train miles	Principal and helper	Light	Loaded (thousands)	Per cent loaded	Gross excl. locos. & tenders	Net rev. and non-rev.	Serviceable	Unstored	Stored	Per cent B.O.
New York Region	Boston & Maine.....	1956	1,562	259,518	266,376	12,296	10,189	64.9	676,221	259,725	64	3	4.5
		1955	1,564	239,688	245,546	9,591	9,145	63.6	603,950	235,772	69	1	6
	N. Y., N. H. & Htd.	1956	1,746	283,637	283,657	15,645	11,711	67.1	730,335	295,443	89	22	19.8
		1955	1,746	263,439	263,521	20,655	10,733	66.2	669,201	266,647	86	5	5.5
		1954	1,746	189,894	195,938	7,816	10,505	69.5	733,579	384,922	31	4	10.3
Great Lakes Region	Delaware & Hudson.....	1956	792	185,736	191,342	10,346	8,791	63.3	634,281	314,337	37	2	3
		1955	792	185,736	191,342	10,346	8,791	63.3	634,281	314,337	37	2	3
	Del., Lack. & Western.....	1956	962	310,750	327,329	28,346	12,734	67.7	843,531	369,017	61	1	1.6
		1955	962	277,818	292,897	21,034	11,843	63.9	797,731	336,275	64	1	1
	Erie.....	1956	2,225	580,684	587,080	19,540	31,689	67.9	1,970,680	793,092	162	3	1.8
Central Eastern Region		1955	2,224	530,698	536,692	15,997	29,079	68.1	1,786,607	712,802	161	3	1.8
	Grand Trunk Western.....	1956	951	301,272	307,438	2,365	9,173	59.5	675,594	281,292	56	17	23.3
		1955	952	256,488	262,032	2,117	8,380	57.7	616,320	243,650	57	4	16
	Lehigh Valley.....	1956	1,137	216,484	220,685	10,231	10,616	67.2	721,412	335,629	34	1	2.9
		1955	1,142	204,060	207,522	6,042	9,869	64.1	668,422	292,866	33	1	2.9
Central Eastern Region	New York Central.....	1956	10,661	2,681,753	2,728,567	127,783	103,884	58.8	7,653,335	3,350,711	603	4	82
		1955	10,661	2,506,501	2,544,734	103,969	97,041	58.4	7,043,787	2,960,438	539	124	86
	New York, Chic. & St. L.....	1956	2,154	757,026	777,792	8,201	31,273	64.1	2,204,081	974,440	177	1	17
		1955	2,155	699,537	720,433	6,445	27,187	61.9	1,922,106	826,094	140	30	41
	Pitts. & Lake Erie.....	1956	221	70,920	71,328	2,936	61.9	257,089	152,820	14	7	19.4	
Central Eastern Region		1955	221	58,876	58,936	2,470	59.9	224,197	133,424	15	7	19.4	
	Wabash.....	1956	2,381	531,737	533,332	6,088	23,509	65.5	1,548,815	611,601	103	2	1.9
		1955	2,381	515,468	517,267	6,449	22,601	65.0	1,458,217	551,744	103	2	1.9
	Baltimore & Ohio.....	1956	5,910	1,721,832	1,916,433	172,595	64,120	58.8	5,337,025	2,546,464	447	2	83
		1955	6,077	1,435,906	1,560,886	128,536	56,139	59.9	4,270,425	1,962,181	412	62	107
Central Eastern Region	Bessemer & Lake Erie.....	1956	208	40,584	40,853	56	1,510	63.9	156,592	96,507	13	3	5
		1955	208	30,050	30,396	44	1,224	73.4	126,708	84,305	9	5	5
	Central RR Co. of New Jersey.....	1956	613	129,399	130,255	6,294	5,123	66.7	387,814	208,181	63	3	4.5
		1955	613	122,310	123,209	5,214	4,494	62.7	343,028	175,808	63	1	6
	Chicago & Eastern Ill.....	1956	868	139,041	139,041	3,278	5,772	62.9	437,514	215,640	28	2	6.6
Central Eastern Region		1955	868	139,041	139,041	3,278	5,772	62.9	437,514	215,640	28	2	6.6
	Elgin, Joliet & Eastern.....	1956	236	95,225	95,589	48	2,996	63.2	244,766	132,446	35	5	12.5
		1955	236	75,758	76,293	2,446	63.1	195,915	106,709	33	7	3	
	Pennsylvania System.....	1956	9,892	3,016,340	3,202,665	234,121	124,576	63.8	8,949,410	4,109,081	790	46	407
		1955	9,892	2,676,017	2,842,705	192,082	110,666	61.2	7,986,140	3,541,547	704	248	419
Central Eastern Region	Reading.....	1956	1,305	388,141	391,731	14,700	15,248	61.9	1,243,166	697,664	163	29	15.1
		1955	1,304	334,457	337,755	12,267	12,135	58.3	1,018,548	519,462	159	15	25
	Western Maryland.....	1956	846	179,400	188,623	12,578	7,273	61.0	628,507	352,827	35	25	12.6
		1955	847	149,041	154,184	8,595	5,359	60.1	450,187	244,092	34	2	112
	Chesapeake & Ohio.....	1956	5,067	1,621,402	1,651,957	56,103	64,980	56.0	5,735,153	3,158,127	450	49	199
Central Eastern Region		1955	5,063	1,329,502	1,349,799	40,111	54,023	57.2	4,578,196	2,496,553	349	3	25
	Norfolk & Western.....	1956	2,103	804,167	870,088	81,612	37,114	57.6	3,527,775	1,943,905	230	3	25
		1955	2,110	649,917	694,376	55,023	29,878	57.8	2,774,442	1,496,127	217	28	10.3
	Atlantic Coast Line.....	1956	5,278	902,201	902,207	10,069	28,863	58.8	2,183,528	968,152	229	7	3.0
		1955	5,334	846,869	846,869	8,893	26,375	57.2	1,943,277	844,659	237	2	2.1
Southern Region	Central of Georgia.....	1956	1,731	198,107	198,132	1,771	8,023	68.7	555,126	271,016	55	2	2.6
		1955	1,731	188,667	188,692	2,049	7,751	68.5	527,544	253,007	72	1	1.4
	Gulf, Mobile & Ohio.....	1956	2,717	278,941	278,941	342	16,116	68.0	1,120,946	538,027	85	6	6.6
		1955	2,717	274,239	274,239	204	14,873	68.0	1,005,838	468,777	82	7	7.9
	Illinois Central.....	1956	6,531	1,255,160	1,256,890	37,596	51,159	62.4	3,782,943	1,778,687	479	5	154
Southern Region		1955	6,539	1,240,748	1,242,929	40,379	48,943	63.0	3,493,103	1,588,078	445	90	164
	Louisville & Nashville.....	1956	4,714	949,453	956,730	20,221	34,914	62.1	2,647,840	1,355,164	192	1	25
		1955	4,715	859,790	865,107	17,093	32,497	61.9	2,441,418	1,224,919	175	43	16
	Nash., Chatt. & St. Louis.....	1956	1,043	178,080	181,896	4,193	8,855	71.0	383,963	180,754	51	2	3.8
		1955	1,043	172,436	176,700	4,411	5,789	70.4	375,066	174,752	49	4	7.5
Southern Region	Seaboard Air Line.....	1956	4,051	685,951	685,951	2,830	27,963	64.4	2,033,646	938,057	141	12	7.8
		1955	4,053	634,277	634,277	1,659	25,841	62.8	1,864,827	831,989	138	10	6.8
	Southern.....	1956	6,259	937,765	937,825	13,595	45,018	66.8	2,974,941	1,369,071	280	3	1.1
		1955	6,264	942,207	942,257	12,427	41,992	65.1	2,772,313	1,234,820	272	1	4
	Chicago & North Western.....	1956	7,810	692,496	694,434	8,781	30,131	66.1	2,040,212	903,930	138	14	32
Northwestern Region		1955	7,848	692,469	694,178	9,792	29,491	65.2	1,979,519	899,476	140	33	54
	Chicago Great Western.....	1956	1,437	137,159	137,159	192	8,180	70.2	543,005	251,945	28	5	15.2
		1955	1,437	137,159	137,159	192	8,180	70.2	543,005	251,945	28	5	15.2
	Chic., Milw., St. P. & Pac.....	1956	10,633	965,939	981,171	18,793	41,655	63.1	2,888,213	1,269,549	271	7	14
		1955	10,633	965,939	981,171	18,793	41,655	63.1	2,888,213	1,269,549	271	7	14
Northwestern Region	Chic., St. P., Minn. & Omaha.....	1956	1,606	153,840	155,323	5,297	5,568	65.5	394,557	176,078	58	1	19
		1955	1,606	153,840	155,323	5,297	5,568	65.5	394,557	176,078	58	1	19
	Duluth, Missabe & Iron Range.....	1956	570	33,264	33,592	703	590	49.1	47,520	20,302	30	24	17
		1955	569	31,785	31,785	162	627	53.9	50,169	23,772	29	30	13
	Great Northern.....	1956	8,273	1,129,272	1,135,953	33,709	41,440	70.2	2,864,689	1,368,355	244	83	53
Northwestern Region		1955	8,288	1,064,200	1,070,408	29,438	37,737	66.9	2,677,403	1,247,115	218	175	40
	Minneapolis, St. P. & S. Ste. M.....	1956	4,171	389,713	392,667	2,648	13,155	64.8	919,857	412,418	82	31	24
		1955	4,171	389,713	392,667	2,648	13,155	64.8	919,857	412,418	82	31	24
	Northern Pacific.....	1956	6,570	870,257	874,834	23,400	32,934	62.5	2,354,232	1,029,610	279	24	55
		1955	6,570	870,257	874,834	23,400	32,934	62.5	2,354,232	1,029,610	279	24	55
Central Western Region	Ath., Top. & S. F. (incl. G. C. & S. F. and P. & S. F.).....	1956	13,124	2,459,407	2,573,509	62,818	109,883	64.5	7,944,574	2,886,192	526	81	37
		1955	13,098	2,219,057	2,320,142	49,745	102,292	63.8	6,863,041	2,573,925	508	89	40
	Chic., Burl. & Quincy.....	1956	8,772	1,064,900	1,057,901	27,786	47,814	66.1	3,218,556	1,401,423	207	28	46
		1955	8,824	1,131,941	1,128,781	34,194	45,493	65.7	3,020,198	1,318,358	251	49	40
	Chic., Rock I. & Pac.....	1956	7,580	922,513	923,691	1,608	37,158	60.9	2,680,501	1,078,611	171	9	4
Central Western Region		1955	7,907	882,695	876,660	1,474	34,792	61.3	2,477,021	1,007,845	166	64	28
	Denver & R. G. Wn.....	1956	2,155	286,893	306,525	29,106	13,493	67.8	950,337	453,790	64	8	28
		1955	2,155	286,893	306,525	29,106	13,493	67.8	950,337	453,790	64	8	28
	Southern Pacific.....	1956	8,066	2,080,995	2,186,148	177,770	93,831	65.0	6,308,916	2,657,718	598	66	94
		1955	8,072	2,007,321	2,107,733	226,405	88,016	64.4	6,080,959	2,487,659	562	79	122
Central Western Region	Union Pacific.....	1956	9,805	2,292,031	2,339,237	108,088	102,678	64.3	6,970,586	2,928,051	403	79	138
		1955	9,813	2,286,211	2,333,487	106,557	101,099	65.7	6,673,394	2,787,153	392	251	127
	Western Pacific.....	1956	1,190	219,917	227,640	17,290	9,266	68.2	639,508	296,256			

For the Month of January 1956 Compared with January 1955

	Region, Road and Year	Freight cars on line			Per Cent B.O.	G.t.m. per train-hr. excl. locos and tenders	G.t.m. per train-hr. excl. locos and tenders	Net ton-mi. per train-mile	Net ton-mi. per car-mile	Net ton-mi. per car-day	Car-miles per car-day	Net daily ton-mi. per road-mi.	Train-miles per train-hour	Miles per loco. per day	
		Home	Foreign	Total											
New Eng. Region	Boston & Maine.....	1956	1,698	9,053	10,751	4.7	40,867	2,613	1,042	26.5	802	46.7	5,570	15.7	151.5
		1955	2,846	7,407	10,253	5.6	40,111	2,525	986	25.8	749	45.6	4,863	15.9	121.7
	N. Y., N. H. & Htd.....	1956	2,141	18,002	20,143	2.0	41,379	2,575	1,042	25.2	476	28.1	5,458	16.1	111.0
		1955	3,116	12,913	16,029	3.5	44,300	2,540	1,012	24.8	549	33.4	4,926	17.4	122.3
	Delaware & Hudson.....	1956	2,059	5,502	7,561	4.7	68,540	3,880	2,036	36.6	1,623	63.7	15,678	17.7	178.3
		1955	7,271	3,879	11,150	7.5	63,728	3,434	1,702	35.4	908	40.5	12,803	18.7	162.6
	Del., Lack. & Western.....	1956	4,172	11,807	15,979	2.8	48,125	2,750	1,203	29.0	716	36.5	12,374	17.7	199.2
		1955	7,983	9,452	17,435	3.0	53,090	2,915	1,229	28.4	609	33.6	11,276	18.5	173.2
	Erie.....	1956	7,113	19,675	26,788	3.7	64,584	3,425	1,378	25.0	942	55.4	11,498	19.0	133.1
		1955	11,254	14,739	25,993	5.4	66,178	3,397	1,355	24.5	860	51.5	10,339	19.7	122.1
Great Lakes Region	Grand Trunk Western.....	1956	4,043	10,266	14,309	6.8	50,089	2,266	943	30.7	628	34.4	9,541	22.3	144.0
		1955	4,102	8,435	12,537	5.8	52,217	2,420	957	29.1	616	36.7	8,256	21.7	117.4
	Lehigh Valley.....	1956	8,193	7,792	15,985	5.9	70,251	3,365	1,565	31.6	668	31.5	9,522	21.1	238.2
		1955	10,046	6,633	16,679	3.7	68,902	3,298	1,445	29.7	569	29.9	8,273	21.0	215.6
	New York Central.....	1956	52,692	100,970	153,662	3.4	49,553	2,897	1,268	32.3	703	37.0	10,139	17.4	153.6
		1955	78,429	74,050	152,479	8.2	50,755	2,851	1,198	30.5	630	35.4	8,958	18.1	122.2
	New York, Chic. & St. L.....	1956	7,365	18,206	25,571	5.8	50,905	2,971	1,314	31.2	1,237	61.9	14,593	17.5	142.5
		1955	9,421	13,851	23,272	8.5	50,805	2,792	1,200	30.4	1,124	59.7	12,366	18.5	122.2
	Pitta. & Lake Erie.....	1956	10,592	4,703	15,295	5.4	53,717	3,643	2,165	52.1	435	13.5	22,306	14.8	167.2
		1955	10,952	4,703	15,295	9.3	56,615	3,842	2,287	54.0	295	9.1	19,475	14.9	100.6
Central Eastern Region	Wabash.....	1956	8,915	9,390	18,305	4.3	63,848	2,924	1,155	26.0	1,046	61.4	8,286	21.9	176.0
		1955	8,888	10,530	19,418	7.3	64,360	2,845	1,076	24.4	931	58.7	7,475	22.6	173.4
	Baltimore & Ohio.....	1956	42,193	50,470	92,663	6.0	47,960	3,149	1,503	39.7	892	38.2	13,899	15.5	132.0
		1955	58,451	36,741	95,192	14.5	48,254	3,007	1,382	35.0	671	32.0	10,416	16.2	98.5
	Bessemer & Lake Erie.....	1956	3,698	1,054	4,752	21.7	65,492	4,054	2,498	63.9	703	17.2	14,967	17.0	95.1
		1955	6,575	590	7,165	20.9	60,597	4,406	2,932	68.9	373	7.4	13,075	14.4	81.6
	Central RR Co. of New Jersey.....	1956	2,448	10,906	13,354	6.6	44,301	3,125	1,677	40.6	522	19.3	10,955	14.8	92.7
		1955	5,771	9,021	14,792	11.9	40,890	2,917	1,495	39.1	380	15.5	9,252	14.6	82.6
	Chicago & Eastern Ill.....	1956	2,368	3,602	5,970	7.8	56,027	3,160	1,557	37.4	1,147	48.8	8,014	17.8	160.1
		1955	2,793	2,734	5,527	7.2	55,488	3,135	1,627	36.4	1,247	52.9	8,435	17.8	168.7
Central Eastern Region	Elgin, Joliet & Eastern.....	1956	6,727	11,021	17,748	5.1	42,929	2,710	1,467	44.2	247	8.8	18,104	8.9	100.8
		1955	8,130	6,608	14,738	9.2	22,251	2,712	1,477	36.6	86	3.6	14,586	9.0	77.0
	Pennsylvania System.....	1956	95,930	96,527	192,457	8.0	52,049	3,046	1,399	33.0	685	32.5	13,400	17.5	97.4
		1955	116,649	87,160	203,809	14.6	54,022	3,060	1,357	32.0	560	28.6	11,549	18.1	77.7
	Reading.....	1956	11,632	24,165	35,797	3.5	48,799	3,203	1,798	45.8	652	23.0	17,245	15.2	80.5
		1955	21,101	13,187	34,288	6.3	46,953	3,047	1,554	42.8	470	18.8	12,850	15.4	68.4
	Western Maryland.....	1956	4,795	6,154	10,949	2.3	46,508	3,586	2,013	48.5	1,089	36.8	13,453	13.3	203.3
		1955	8,332	2,242	10,574	2.2	45,354	3,075	1,668	45.5	706	25.8	9,296	15.0	170.2
	Chesapeake & Ohio.....	1956	45,124	30,275	75,399	1.3	66,852	3,562	1,962	48.6	1,343	49.3	20,106	18.9	102.9
		1955	56,148	25,737	81,885	4.9	65,510	3,462	1,888	46.2	975	36.9	15,906	19.0	81.6
Central Eastern Region	Norfolk & Western.....	1956	32,937	11,108	44,045	1.6	73,119	4,513	2,487	52.4	1,442	47.8	29,818	16.7	129.6
		1955	38,175	6,440	44,615	2.1	73,753	4,416	2,381	50.1	1,065	36.8	22,873	17.3	96.4
	Atlantic Coast Line.....	1956	18,316	19,005	37,321	4.4	45,294	2,431	1,079	33.6	851	43.1	5,918	18.7	137.6
		1955	21,568	14,743	36,311	3.4	41,199	2,303	1,001	32.0	736	40.2	5,108	18.0	126.2
	Central of Georgia.....	1956	2,420	6,901	9,321	3.5	48,966	2,808	1,371	33.8	951	41.0	5,051	17.5	92.2
		1955	3,566	5,538	9,104	4.7	49,928	2,803	1,344	32.6	932	41.7	4,715	17.9	95.6
	Gulf, Mobile & Ohio.....	1956	5,035	11,058	16,093	2.9	76,840	4,025	1,932	33.4	1,056	46.5	6,388	19.1	107.1
		1955	6,489	8,508	14,997	2.9	75,154	3,673	1,712	31.5	1,018	47.5	5,566	20.5	106.9
	Illinois Central.....	1956	23,792	27,129	50,921	2.3	49,764	3,059	1,438	34.8	1,106	51.0	8,785	16.5	75.5
		1955	29,079	20,992	50,071	2.5	48,474	2,849	1,295	32.4	1,023	50.1	7,834	17.2	66.0
Southern Region	Louisville & Nashville.....	1956	26,938	15,404	42,342	3.0	49,131	2,796	1,431	38.8	1,038	43.1	9,273	17.6	158.9
		1955	35,372	11,880	47,252	4.4	50,602	2,847	1,429	37.7	810	34.7	8,380	17.8	116.8
	Nash., Chatt. & St. Louis.....	1956	3,351	3,135	6,486	5.2	42,954	2,159	1,017	30.9	909	41.5	5,590	19.9	124.0
		1955	4,070	2,904	6,974	3.1	44,276	2,180	1,016	30.2	808	38.0	2,405	20.4	118.1
	Seaboard Air Line.....	1956	12,484	17,174	29,658	2.6	55,658	3,033	1,399	33.5	1,036	48.0	7,470	18.8	172.4
		1955	14,653	12,735	27,388	2.8	54,750	2,983	1,331	32.2	953	47.1	6,622	18.6	163.8
	Southern.....	1956	14,745	25,917	40,662	3.0	54,772	3,185	1,466	30.4	1,078	53.1	7,056	17.3	119.4
		1955	18,560	22,963	41,523	4.9	51,250	2,952	1,315	29.4	939	49.0	6,359	17.4	122.6
	Chicago & North Western.....	1956	15,387	29,558	45,345	5.3	53,693	2,997	1,329	30.0	665	33.5	3,734	18.2	134.3
		1955	18,398	27,377	45,775	4.4	51,794	2,921	1,327	30.5	659	33.1	3,697	18.1	110.5
Northwestern Region	Chicago Great Western.....	1956	1,562	4,002	5,564	3.6	74,194	3,968	1,841	30.8	1,438	66.5	5,656	18.8	139.9
		1955	2,050	3,778	5,828	3.4	74,145	3,833	1,715	30.2	1,217	60.2	5,098	19.4	135.3
	Chic., Milw., St. P. & Pac.....	1956	29,945	32,081	62,026	6.0	56,452	2,998	1,310	30.4	663	34.5	3,852	18.9	119.9
		1955	36,158	29,290	65,448	6.0	55,686	2,906	1,281	30.5	617	32.1	3,767	19.2	104.0
	Chic., St. P., Minn. & Omaha.....	1956	1,197	8,231	9,428	3.3	36,415	2,595	1,158	31.6	621	30.0	3,537	14.2	74.2
		1955	1,186	7,527	8,713	5.2	34,287	2,364	969	28.7	621	33.2	3,166	14.6	75.0
	Duluth, Missabe & Iron Range.....	1956	13,405	788	14,193	2.1	21,649	1,513	647	34.4	45	2.7	1,149	15.2	19.2
		1955	14,643	761	15,404	1.9	22,487	1,705	808	37.9	50	2.5	1,348	14.2	18.6
	Great Northern.....	1956	21,477	21,471	42,948	2.9	50,876	2,564	1,225	33.0	1,020	44.0	5,335	20.1	107.2
		1955	23,914	18,559	42,473	3.4	51,398	2,533	1,180	33.0	955	43.2	4,854	20.4	87.7
Northwestern Region	Minneapolis, St. P. & S. Ste. M.....	1956	5,990	8,814	14,804	5.6	49,004	2,375	1,065	31.4	891	43.8	3,190	20.8	153.2
		1955	7,462	7,486	14,948	5.8	44,685	2,124	967	30.3	764	37.3	2,783	21.2	111.3
	Northern Pacific.....	1956	18,684	19,377	38,061	5.4	53,663	2,718	1,225	31.1	895	43.6	5,177	19.8	89.4
		1955	21,634	16,161	37,795	5.3	53,751	2,727	1,192	31.3	896	45.9			

DEUTZ



625
TM

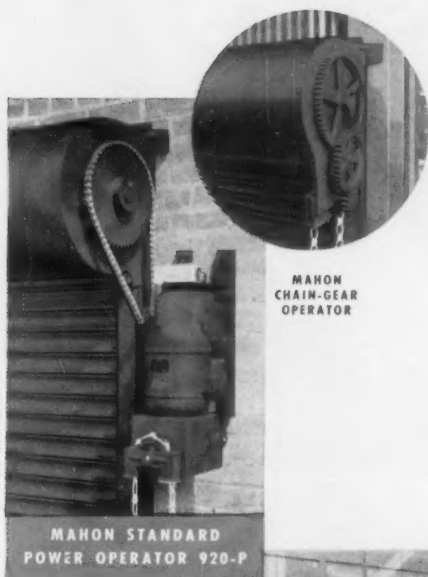
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HAIRINSUL

**Signal for
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Thoroughly washed and sterilized, all-hair heat barrier. Rated conductivity — .25 btu per square foot, per hour, per degree F., per inch thick.

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Advanced processing methods reduce weight of STREAMLITE HAIRINSUL by 40%.

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Does not disintegrate when wet, resists absorption. Will not shake down, is fire-resistant and odorless.

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STREAMLITE HAIRINSUL is available ½" to 4" thick, up to 127" wide. Stitched on 5" or 10" centers between two layers of reinforced asphalt laminated paper. Other weights and facings are available.

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The all-hair content does not deteriorate with age; therefore has high salvage value. No other type of insulation offers a comparable saving.

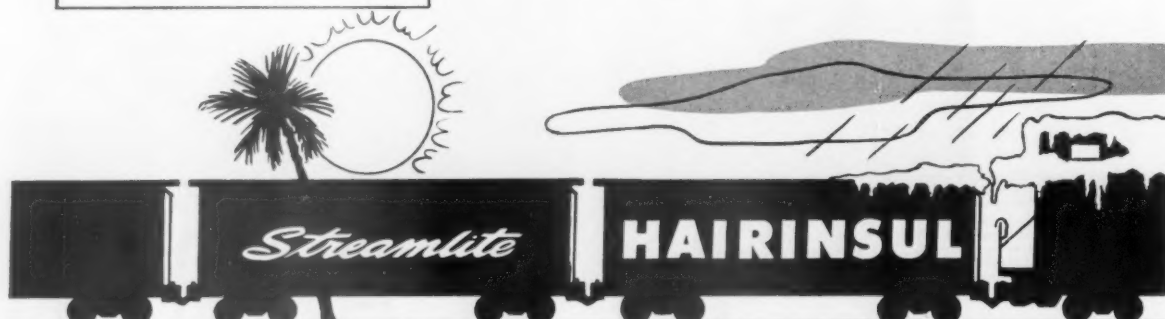
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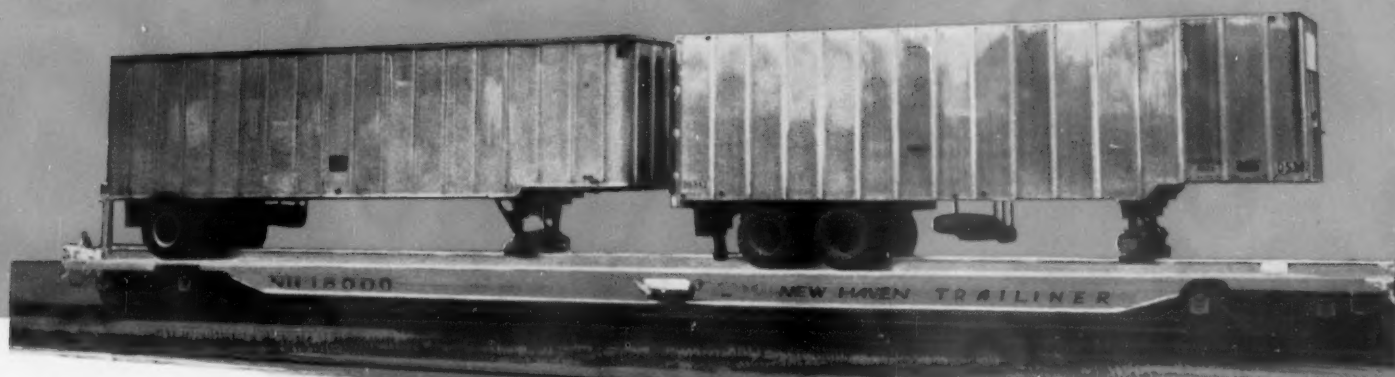
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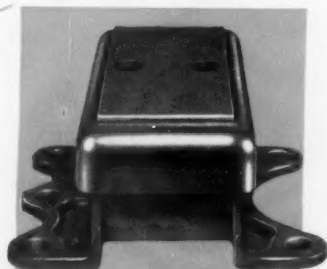
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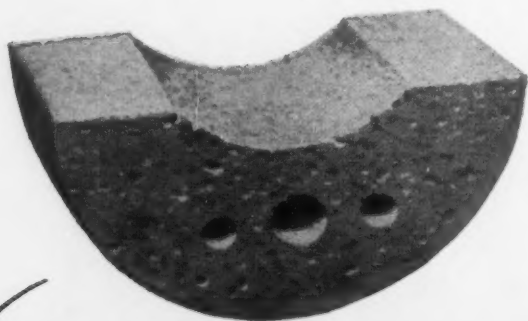
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